THE RUBBER AGE AND TIRE NEWS

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INDEX TO CONTENTS

Notes on Cemented Seams and Rubber Cements 421
Rubber Age Information Exchange..... 423
Bower's Customary—Metric Tables..... 424
Rubber Products at the Aeronautical Exposition 426
Secretary Redfield Explains His Plan..... 428
Editorials 429
Happenings of Interest to Rubber Men..... 430
TIRE NEWS:
British Road Committee Report on Solid Tires 431
The New Revenue Law and the Tire Industry. 432
Notes of the Tire Trade..... 433
Tires in All Sizes to Be Manufactured..... 434
Tire Trade News Items..... 434
Happenings of Interest to Tire Men..... 435
Miscellaneous Items of Interest..... 436
MARKETS:
Manufactured Rubber Goods..... 437
Cotton, Yarn and Fabrics..... 437
Chemicals and Compounding Materials..... 438
Crude Rubber and Scrap Rubber..... 439
Patents 440

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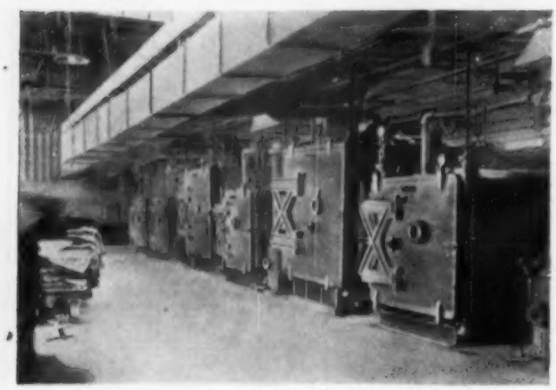

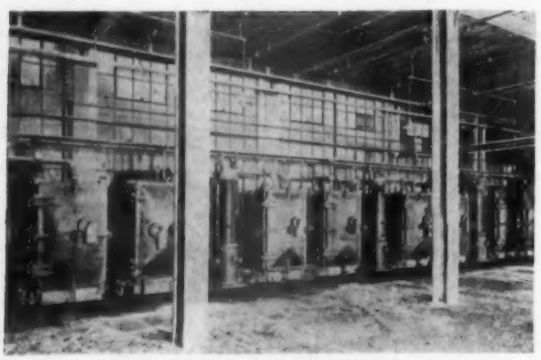

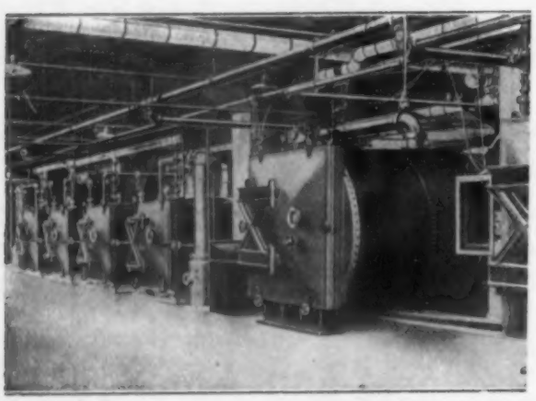

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THE RUBBER AGE AND TIRE NEWS

Notes on Cemented Seams and Rubber Cements

By Junius David Edwards and Irwin L. Moore

Chemists, Bureau of Standards

Rubber cement finds many uses in the industry, particularly for the fabrication and repair of rubber goods. Nowhere, perhaps, is a knowledge of the principles underlying its use so essential as in the fabrication of a balloon, which requires the cementing of the different pieces of fabric to build up the gores and panels which form the envelope, and for the attachment of appendages, and the cementing patches. In addition to being gas-tight these seams must also bear considerable mechanical load, and although they may be further strengthened by stitching, it is of some importance that the cemented joint shall be as strong as possible because any slipping will throw an undue load on the stitching. Furthermore, any loosening or slipping of the seam will cause excessive leakage of the balloon gas.

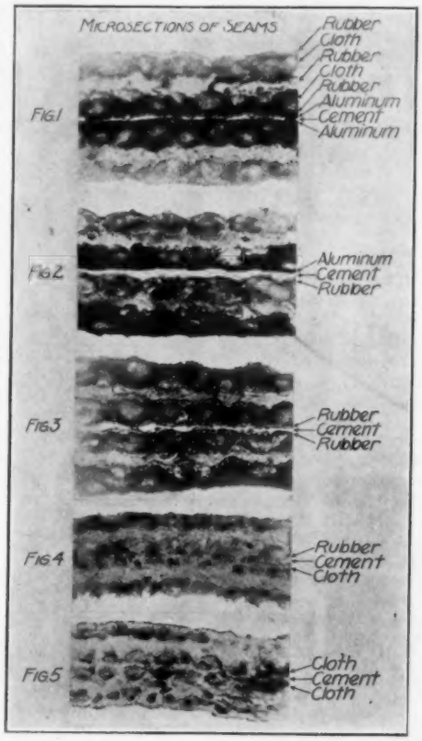
The Bureau's attention was called to this matter by some experiments of the Goodrich and Goodyear rubber companies on cementing aluminum coated fabrics together. The unexpected result of these tests was that when the aluminum coating was buffed off, presumably to give a better holding surface for the cement, the cemented joint made thereon was inferior in strength to joints made without any preliminary treatment of the surface.

In endeavoring to arrive at the proper explanation for this fact we have made numerous tests on seams and cements. The object has been to establish the principles underlying good seam construction and to develop suitable methods for testing the seams and cements under investigation.

Characteristics of Seams

In constructing a balloon envelope there are a variety of surfaces that may have to be cemented together and, as we have already noted, the character of the surfaces has an important effect on the strength of the cemented seams. For determining the strength of seams which were to be investigated, the following test was adopted as a standard.

The seam was prepared by first washing with benzine or gasoline, the surface to be cemented, and then applying smoothly two coats of cement. The first coat of cement was allowed to dry somewhat before applying the second coat. Before the second coat was fully dry, the surfaces were lapped and pressed firmly together by rolling with a steel roller; the width of lap used was 0.5 inch. These seams were allowed to set for at least 24 hours before testing. Strips one inch wide were then cut from the larger pieces and suspended in a constant temperature air bath under a tension of 1 kilogram. The time required for the seam to break was taken as a measure of its strength.



FIGS. 1, 2, 3, 4 AND 5

Effect of Character of Surface

Seams were constructed of different kinds of balloon fabric to show the effect of differences in the character of the surfaces on the holding power of the seam. The same sample of a high-grade balloon cement was used in all of these seams. They may be described as follows: (1) Cloth cemented to cloth (CC), (2) rubber cemented to cloth (RC), (3) rubber cemented to rubber (RR), (4), rubber cemented to an aluminized surface (RA) and (5) aluminized surface cemented to an aluminized surface (AA). These seams were subjected to the test described above after permitting them to set for a suitable time. Table 1 gives the average of a number of determinations of the time required to break under a tension of 1 kilogram per inch of width at 55°C. Figures 6 and 7 which give the variation in the times required for the seams to break under different loads and at different temperatures, show graphically the relative strengths of some of these seams. They rank clearly in the following order, the strongest being placed first:

(1) Aluminized surface cemented to aluminized surface.
(2) Rubber surface cemented to aluminized surface.
(3) Rubber surface cemented to rubber surface.
(4) Cloth surface cemented to rubber surface.
(5) Cloth surface cemented to cloth surface.

This order and practically the same relative strengths were found to hold both when the seams were tested within 24 hours after they were made and also several weeks later. It is apparent from Figs. 6 and 7 that the relative strengths will vary somewhat with the conditions of test: this point will be discussed in a succeeding section.

TABLE 1.—RELATIVE STRENGTH OF SEAMS MADE BY CEMENTING DIFFERENT SURFACES TOGETHER

Seam No.	Description.	Average time required to break at 55° C. under a constant load of 1 kg. per in.
1	Cloth cemented to cloth	7 minutes
2	Cloth cemented to rubber	10 minutes
3	Rubber cemented to rubber	30 minutes
4	Rubber cemented to aluminized surface	100 minutes
5	Aluminized surface cemented to aluminized surface	400 minutes

Essentials of Good Construction

The load on a cemented lap in an inflated balloon is almost entirely a shearing stress caused by the surface tension which results from the pressure of the gas in the envelope, and the weight on the suspension. This condition has been duplicated in the tests made by subjecting the test pieces to direct tension along their length, thus making the stress in the cement film a shearing one. Since there is no tensile force tending to pull the seams apart perpendicular to the fabric, the film having the greatest shearing strength is the most desirable. For this reason as thin a coat of the cement as is feasible to apply and insure complete adhesion to both surfaces is the strongest. Both the characteristics of the surface and the quality of the cement may defeat this purpose. If the cement is thick and lumpy great difficulty is ex-

perienced in getting a smooth coat and in securing complete wetting of the surface. If the surface is rough, the film is not maintained uniformly thin, even when spread smoothly. Rubber is comparatively inelastic and suffers shearing deformation easily. This deformation is particularly large in thick films and the load is consequently thrown onto the thin places, which give way under the unequal distribution of the load. The stress is then carried by the next thinnest place

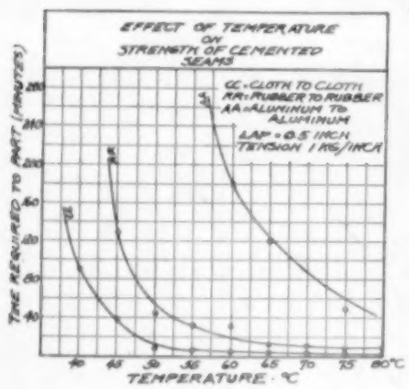


Fig. 6

and so on until the lap slips apart. A smooth surface is also desirable because small irregularities may form cups which the cement bridges with a film and the consequent poor adhesion may result in the finished lap and a considerable portion of the cemented area not bearing its share of the load.

The actual physical properties of the surface are also of importance. Good adhesion is not secured if the surface is not wetted thoroughly by the cement. This purpose is defeated in the case of rough surfaces, as pointed out above. The presence of grease or dust on the surface also prevents the cement from adhering properly. For this reason, seams which receive a preliminary washing with benzine show somewhat higher strength than when the washing is omitted. Even in the case of very smooth, clean surfaces, however, adhesion may not be perfect because the cement may be separated from the surface by a thin film of air which will be detrimental to the strength of the seam.

A study of the microsections, Figs. 1, 2, 3, 4 and 5, demonstrates the validity of these assumptions regarding the factors contributing to strength. The aluminum to aluminum seam (Fig. 1), which is the strongest of any experimented with, shows a remarkably smooth thin film in which adherence to the aluminized surface is practically perfect, and which is free from thick places, bare spots and other imperfections. At the other end of the scale is the cloth to cloth seam which presents a vastly different appearance. The cement film is very irregular and varies widely in thickness and closeness of adhesion from place to place. The other types of construction show characteristics ranging successively between these two extremes, none being so markedly poor as the cloth to cloth and none so good as the aluminum to aluminum seam.

To be sure of a strong seam, therefore, one must have a smooth, clean surface which will wet easily with the cement. The cement must be applied smoothly and evenly and the lap pressed firmly together before too dry.

Cements

In addition to the character of the surfaces cemented together, the kind of cement used also has a considerable effect on the strength of the seam produced. This is in the last analysis the determining factor, for as pointed out above, the seam fails in shear and the elastic properties of the cement determine the amount or shear even though the uniformity, adhesion, and thickness of film modify the result. The best grades of balloon cement are made by dissolving new rubber in benzine and thoroughly kneading the mass in a dough mixer. The finished cement must be smooth, free from lumps and thin enough to spread easily and smoothly on the surface to which it is to be applied.

Tests were made with two grades of commercial balloon cement, one grade of self-vulcanizing tire cement, and one rubber cement made up by dissolving old raw rubber in benzine and mixing by hand. Seams were made with these cements by cementing two rubberized surfaces together; the results are comparable with the seam described in Table 1 as rubber to rubber (RR). The results of tests on these four cements are given in Table 2.

Table 2.—Relative Holding Powers of Cements

Seam No.	Cement.	Aver. time required to break at 55° C.; lap = 0.5 in.; tension = 1 kg. in.
1	Old raw rubber dissolved in benzine mixed by hand.....	3 minutes
2	Balloon cement. Manufacturer A	9 minutes
3	Balloon cement. Manufacturer B	30 minutes
4	Self-vulcanizing tire cement...	160 minutes

Testing Methods

The conditions of test have an important effect on the apparent strength of the seam, as would of course, be expected. It is important therefore, that the conditions that affect the apparent strength shall duplicate, as far as possible, the conditions of service. For example, the tests were made under constant tension because the seams are under constant tension in a balloon. A load of 1 kilogram was used because it is at least of the same magnitude as the loads the seams may bear in service. Temperatures above ordinary air temperatures were used because of the increase in temperature of the balloon fabric when exposed to sunlight. In fact most seam failures occur when the fabric becomes "overheated."

The effects of variations in the load, temperature of fabric and width of lap were found by suitable tests in order that the conditions of test might be intelligently selected.

Effect of Temperature Upon Strength of Seam

As pointed out above, the failure of seams usually occurs when the laps have become overheated. In kite balloons with outside coatings of dyed or pigmented rubber, fabric temperatures of 25° to 35° C. above air temperature are not uncommon during the summer. The temperature rise in the case of aluminized fabrics is somewhat less. To duplicate the conditions of service it was necessary therefore, to make tests at a higher temperature than ordinary room temperatures, and 55° C. was chosen as representing a fair point at which to make determinations of the relative strengths of the various types of laps. The effect of temperature on the time required to part was investigated in detail, however, to determine the variation in strength due to differences in temperature.

Seams were made up in the usual manner and placed in a constant temperature air bath under a tension of 1 kilogram per inch of width, and the time required for the seam to break at temperatures from 45° to 80° C. at 5 degree intervals was determined. Figure 6 shows graphically the relation between the temperature and time of break for three different types of seams. These all have the same general shape and all show a critical temperature region below which the strength of the seam is nearly a linear function of the temperature, the strength increasing rapidly as the temperature decreases. In this region there is presumably a transition from viscous to plastic flow; above this temperature the ordinarily plastic rubber becomes in effect a more or less viscous fluid depending on the temperature attained, and the lap parts very quickly. This transition point is not clearly marked, however, and is obscured by variations in the strength of adherence of

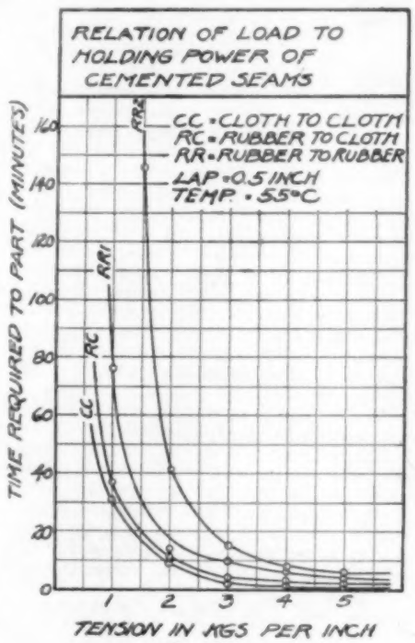


Fig. 7

the cement to the different types of surface. In the case where the aluminized surfaces are cemented together, the time of breaking is more nearly a linear function than with the other types, which indicate very close adhesion to the aluminum surface, so that even when the viscous state is reached the time required to part is still quite high.

The extraordinary strength of cemented laps at ordinary temperatures is shown in Table 3. Pieces of three seams made up as described in the table were suspended under a tension of 25 pounds per inch of width at ordinary room temperature which was between 25° C. and 30° C. The best of these seams showed no tendency to slip during long periods of test. The method of test, while it shows the strength under ordinary conditions, does not duplicate the conditions of service and was abandoned for that reason.

Table 3.—Test of Seams at Room Temperature, About 25° C.

Seam No.	Construction.	Time required to part Lap 0.5 in. tention 25 lbs. per in. 1st test piece.	2nd test piece.
H	Rubber to aluminized surface; washed with benzine	over 68 hours	over 50 hours

I	Rubber to aluminized surface; untreated...	over 13 hours	50 hours
J	Cloth to cloth; rubber and aluminum surface buffed off with wire brush	48 min.	71 min.

Note.—Seam I on first test piece showed a slight imperfection at the center of the lap where adhesion was not complete.

Tension

In practice the load on a cemented lap may average about 1.5 kilogram (3.3 pounds) per linear inch. For testing purposes therefore, 1 kilogram per inch was chosen as a fair value. Tests were made, however, to determine the effect of different tensions on the apparent strength of seams. Figure 7 shows the variations of breaking time with loads of from 1 to 5 kilograms per inch at 55° C. A study of these curves shows that for loads above 2 kilograms per inch there is little difference in the time required to break for the various types of seams so that for testing purposes loads below this value must be used to show the true variation in strength with different types of surfaces and cements.

Width of Lap

It is obvious that increased strength can be obtained by increasing the width of lap. This increase in strength is not a linear function, but increases roughly as the cube of the width of lap at small widths and even faster with wider laps. This is to be expected since the slipping apart is a gradual process dependent on the giving way one after another of infinitesimal points of contact and when we have a wide lap we not only have more points of adhesion, but less stress is also put on each element of the cement film. This corresponds to a decrease in load and the slipping goes on much more slowly at the lighter loads, the decrease bearing much the same relation to the lap as that shown in our load curves (see figure 7). Figure 8 shows the relation between lap and time required to part for five widths of lap. These tests were made at 55° C. with the seams under a tension of 1 kilogram per inch.

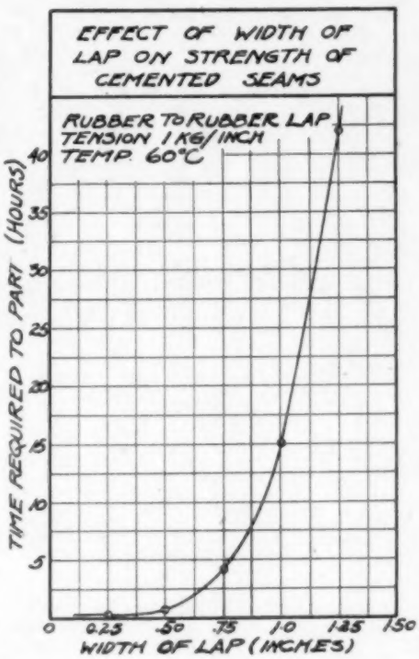


FIG. 8

Coats of Cement

The evidence on the effect of varying the number of coats of cement is conflicting. This is to be expected since definite amounts of rubber cannot be spread when the material is merely brushed on by hand. It is essential, of course, to get sufficient rubber on the surface to give a continuous film all over it. Once this is done the addition of more of the material only serves to weaken the seam, since it allows more shearing deformation to take place when the load is applied. For most rubberized fabrics two coats are essential and sufficient. For aluminized fabric one coat, if properly applied frequently gives quite as good a holding power as two coats and certainly better than three.

Summary

We have shown by tests and the examination of microsections of cemented seams what the essentials of good seam construction are. A good seam requires, first of all, a good cement. Next the surfaces to be cemented should be smooth and clean and easily wetted by the cement. The cement should be applied in a thin coat of uniform thickness; two coats are usually sufficient. The strength of the seam will be profoundly influenced by the character of the cemented surfaces. The variations in the strength with change in temperature, load and width of lap have been shown graphically. The methods of testing are described and the significance of different conditions of test is discussed.

Rubber Age Information Exchange

Cold Cure Tube Patches

Inquiry No. 84—We are large jobbers and manufacturers' agents for automobile accessories, electrical supplies, mine, mill, factory and quarry equipment, and should appreciate your putting us in touch with manufacturers of cold cure patches for inner tubes, for use with or without cement. We desire to have patches made with our imprint.

Answer—The following is a list of manufacturers of inner tube patches. We believe most of these concerns will be glad to make patches with your imprint if you are ready to place an order sufficiently large: Acme Rubber Mfg. Co., Trenton, N. J.; American Rubber & Tire Co., 100 Beach St., Akron, Ohio; Bowling Green Rubber Co., Toledo, Ohio; Braender Rubber & Tire Co., Rutherford, N. J.; H. O. Canfield Co., Bridgeport, Conn.; Continental Rubber Works, Erie, Pa.; Bull's Eye Rubber Co., 131 Harris Ave., Long Island City, N. Y.; Empire Rubber & Tire Co., Trenton, N. J.; Endurance Tire & Rubber Co., New Brunswick, N. J.; Geo. W. Eno Rubber Co., 1036 S. Los Angeles St., Los Angeles, Cal.; Federal Rubber Co., Cudahy, Wis.; Firestone Tire & Rubber Co., Akron, Ohio; Fisk Rubber Co., Chicopee Falls, Mass.; General Tire & Rubber Co., Akron, Ohio; the B. F. Goodrich Co., Akron, Ohio; Goodyear Tire & Rubber Co., Akron, Ohio; Hood Tire Co., Watertown, Mass.; Howe Rubber Co., New Brunswick, N. J.; Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.; International Rubber Co., Denver, Col.; Kendall Tire & Rubber Co., Ohio Bldg., Akron, Ohio; Keystone Rubber Mfg. Co., Erie, Pa.; Long-Wear Rubber Co., Elyria, Ohio; Michelin Tire Co., Milltown, N. J.; Chas. E. Miller, Anderson, Ind.; Miller Rubber Co., Akron, Ohio; Oliver Tire & Rubber Co., 2135 Broadway, Oakland, Cal.; Pennsylvania Rubber Co., Jeannette, Pa.; Pettey Rubber Mfg. Co., 241 Oregon St., Milwaukee, Wis., Polson Rubber Co., 1657 Doan Ave., Cleveland, Ohio; Portage Rubber Co., Barberton, Ohio; Quaker City Rubber Co., 629 Market St., Philadelphia, Pa.; Savoie Rubber Co., Central Falls, R. I.; Star Rubber Co., Akron, Ohio; Sterling Tire Corporation, Rutherford, N. J.; V. K. Sturges Co., Oakland, Cal.; United States Rubber Co., 1790 Broadway, New York City, and the Voorhees Rubber Mfg. Co., 20 Bostwick Ave., Jersey City, N. J.

Wants Rubber Balloons

Inquiry No. 85—I am an established merchant in Paris, France, and want to buy and sell rubber baloons. I should appreciate your putting me in touch with American manufacturers of the same.

Answer—The following is a list of American and Canadian manufacturers of toy balloons: Faultless Rubber Co., Ashland, Ohio; Davol Rubber Co., Providence, R. I.; Gregory Rubber Co., Warren, Ohio; Miller Rubber Co., Akron, Ohio; United States Rubber Co., 1790 Broadway, New York City; Western Reserve Rubber Co., Akron, Ohio; Sterling Rubber Co., Ltd., Guelph, Ontario, Canada; Canadian Consolidated Rubber Co., Ltd., Montreal, Canada; F. A. Cigol Rubber Co., 143 Berkley St., Philadelphia, Pa.; the Lyon Rubber Co., Akron, Ohio; Baumann Rubber Co., New Hoven, Cann.; Behrend & Rothschild, 355 Broadway, New York City; Globe Rubber Co., 346 Market St., Akron, Ohio; Howe Baumann Balloon Co., 187 Murray St., Newark, N. J.; Lincoln Rubber Co., Akron, Ohio; King Rubber Co., Hyde Park, Mass.; Oak Rubber Co., Ravenna, Ohio; Pioneer Rubber Specialty Co., Akron, Ohio; Sun Novelty Co., Bloomfield, N. J., and H. C. Straley, 1425 W. 84th St., Cleveland, Ohio.

Elastic Fabrics

Inquiry No. 86—I am a French merchant supplying department stores and other retailers and manufacturers with elastic fabrics. Please put me in touch with American manufacturers of these articles.

Answer—We are pleased to furnish you the following list of American manufacturers of elastic fabrics: United States Rubber Co., 1790 Broadway, New York City; Dunlop Tire & Rubber Goods Co., Ltd., Booth Ave., Toronto, Canada; the B. F. Goodrich Co., Akron, Ohio; Easthampton Rubber Thread Co., Easthampton, Mass.; Dryder Rubber Co., 930 Dripont Bldg., Chicago, Ill.; Goodyear Rubber Co., Middletown, Conn., and Chas. E. Miller, Anderson, Md.

Rubber Nipples

Inquiry No. 87—I want to buy and sell in France rubber nipples and should appreciate your placing me in touch with American manufacturers of the same.

Answer—The following is a list of American and Canadian manufacturers of rubber supplies: Canton Rubber Co., Canton, Ohio; Davidson Rubber Co., Boston, Mass.; Davol Rubber Co., Providence, R. I.; Faultless Rubber Co., Ashland, Ohio; the B. F. Goodrich Co., Akron, Ohio; Hodgman Rubber Co., Tuckahoe, N. Y.; L & M Rubber Co., Carrollton, Ohio; Mayflower Rubber Co., South Braintree, Mass.; Miller Rubber Co., Akron, Ohio; Para Products Co., South River, N. Y.; Parker Stearns & Co., Sheffield Ave., Brooklyn, N. Y.; Rubber Products Co., Barberton, Ohio; Seamless Rubber Co., New Haven, Conn.; Tyer Rubber Co., Andover, Mass.; United States Rubber Co., 1790 Broadway, New York City; Whitall-Tatum Co., 46 Barclay St., New York City; Canadian Consolidated Rubber Co., Ltd., Montreal, Canada, and the Scioto Rubber Co., Columbus, Ohio.

Wants Druggists' Sundries Line

Inquiry No. 88—We are seeking a good line of druggists' sundries to handle on a commission basis in the Maritime Provinces of Canada. We have ten years' experience in this business and should like you to put us in touch with some reliable concerns.

Answer—The following concerns manufacture druggists' sundries. As to their arrangements for the territory in question, you will have to communicate with them direct: Aetna Rubber Co., 807 E. 79th St., Cleveland, Ohio; American Hard Rubber Co., 11 Mercer St., New York City; Aseptic Products Co., Borden Ave., Long Island City, N. Y.; Atlantic Rubber Co., Atlantic, Mass.; Augustine, W. B., Drawer H, South Akron, Ohio; Bauer & Black, 25th & Dearborn Sts., Chicago, Ill.; Brooklyn Shield & Rubber Co., 401 Sumner Ave., Brooklyn, N. Y.; Canadian Consolidated Rubber Co., Ltd.,

Montreal, Quebec; Canadian Rubber Co. of Montreal, Ltd.; Canton Rubber Co., Canton, Ohio; Chemical Rubber Co., 1905 W. 112th St., Cleveland, Ohio; Davidson Rubber Co., Caldwell St., Charlestown District, Boston, Mass.; Davol Rubber Co., 69 Point St., Providence, R. I.; Dean Plaster Co., Yonkers, N. Y.; Faultless Rubber Co., Ashland, Ohio; Featheredge Rubber Co., 408 W. Grand St., Chicago, Ill.; Flexible Rubber Goods Co., Salisbury, Conn.; Goodrich, B. F., Co., Akron, Ohio; Gordon Tire & Rubber Co., Canton, Ohio; Halifax Rubber Co., Halifax, Pa.; Hendler, Jesse, Trenton, N. J.; Hodgman Rubber Co., Tuckahoe, N. Y.; Ideal Rubber Co., 830 Main St., Clifton, N. J.; King Rubber Co., Hyde Park Mass.; Kleinert, I. B., Rubber Co., 725 Broadway, New York City; L. & M. Rubber Co., Carrollton, Ohio; Lambertville Rubber Co., Lambertville, N. J.; Lee Tire & Rubber Corp., Conshohocken, Pa.; Lincoln Rubber Co., Barberton, Ohio; McCue & Pierce, Heath, corner Heil Sts., Trenton, N. J.; Mechanical Rubber Co., Cleveland, Ohio; Mechanical Rubber Co., Chicago, Ill.; Miller Rubber Co., Akron, Ohio; Mystic Rubber Co., 217 Arlington St., W. Medford, Mass.; New York Mackintosh Co., 39 West 32nd St., New York City; Omo Mfg. Co., Middletown, Conn.; Oriental Rubber Co., 458 Searing St., Newark, N. J.; Parker, Stearns & Co., 300 Sheffield Ave., Brooklyn, N. Y.; Partridge, F. R., Rubber Co., 146 Iberville St., Montreal, Canada; Pike Rubber Co., 126 West South St., Akron, Ohio; Progress Rubber Co., Trenton, N. J.; Raley Rubber Co., New Haven, Conn.; Reality Rubber Co., Massillon, Ohio; Rosenthal & Katz, 73 Fifth Ave., New York City; Royal Rubber Works, Trenton, N. J.; Rubber Goods Mfg. Co., Broadway & 58th St., New York City; Rubber Products Co., Barberton, Ohio; Rubber Stopple Co., 62 West End Ave., Long Island City, N. Y.; Rubberset Rubber Co., 56 Ferry St., Newark, N. J.; Schein, S., & Sons, 140 Nassau St., Newark, N. J.; Schmid-Lyon Rubber Co., Akron, Ohio; Scioto Rubber Co., Columbus, Ohio; Seamless Rubber Co., New Haven, Conn.; Star Rubber Co., Akron, Ohio; Steece, Mortimer, Spaulding & Grand Aves., Chicago, Ill.; Sterling Rubber Co., Ltd., Guelph, Ontario; Transparent Rubber Co., Rutherford, N. J.; Traun Rubber Co., Rutherford, N. J.; Tyer Rubber Co., Andover, Mass.; Unitel States Rubber Co., Broadway & 58th St., New York City; Vulcalose Co., 216 W. Kinzie street, Chicago, Ill.; Whitall-Tatum Co., Milville, N. J.; White, S. S., Dental Mfg. Co., 12th & Chestnut Sts., Philadelphia, Pa., and Xenia Rubber Mfg. Co., Xenia, Ohio.

Wants Radiator Hose

Inquiry No. 89—We are large Western jobbers and wish to purchase a lot of radiator hose for one of our large accounts and must necessarily secure a low price if we are to handle this business. Please give us a list of manufacturers whom you believe could give us the right price as well as the material which we desire.

Answer—The following is a list of manufacturers of radiator hose taken from our files: Boston Belting Corp., 84 Linden Park St., Boston, Mass.; Boston Woven Hose & Rubber Co., 29 Hampshire St., Cambridge, Mass.; Century Rubber Works, 1346 Rawson St., Chicago, Ill.; Cincinnati Rubber Mfg. Co., Norwood, Cincinnati, Ohio; Combination Rubber Mfg. Co., Bloomfield, N. J.; Continental Rubber Works, Erie, Pa.; Electric Hose & Rubber Co., Wilmington, Del.; Empire Rubber & Tire Co., Trenton, N. J.; Essex Rubber Co., Trenton, N. J.; Federal Rubber Co., Cudahy, Wis.; Goodyear Tire & Rubber Co., Akron, Ohio; Gutta Percha & Rubber Co., Ltd., 47 Younge St., Toronto, Canada; Hamilton Rubber Mfg. Co., Trenton, N. J.; Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.; Mattson Rubber Co., Lodi, Bergen Co., N. J.; New Jersey Car Spring & Rubber Co., Wayne & Brunswick Sts., Jersey City, N. J.; Quaker City Rubber Co., 629 Market St., Philadelphia, Pa.; Republic Rubber Corp., Youngstown, Ohio; Strong Rubber & Asbestos Mfg. Co., 48 Franklin St., New York City; Thermoid Rubber Co., Trenton, N. J.; United & Globe Rubber Mfg. Co., 1790 Broadway, New York City; Woven Steel Hose & Rubber Co., Trenton, N. J.; Canadian Consolidated Rubber Co., Ltd., Montreal, Canada; Dunlop Tire & Rubber Goods Co., Ltd., 244 Booth Ave., Toronto, Canada; the B. F. Goodrich Co., Akron, Ohio, and American Para Rubber Co., 6727 South Broadway, St. Louis, Mo.

Tire Sample Machine

Inquiry No. 90—We are in need of a good machine for cutting cross-section samples from automobile tire casings and should appreciate your putting us in touch with a good manufacturer of the same.

Answer—The Akron Rubber Mold & Machine Co., 917 Sweitzer Ave., Akron, Ohio, makes a good machine for cutting cross-section samples from tire casings.

Wants Tube Stock

Inquiry No. 91—Please tell me where, in the vicinity of New York City, I can obtain good quality calendered rubber sheet suitable for manufacturing automobile tire inner tubes.

Answer—The Beacon Tire Co., Beacon, N. Y., and the Bull's Eye Rubber Co., 131 Harris Ave., Long Island City, N. Y., can supply you with what you desire.

Repairing Cord Truck Tires

Inquiry No. 92—I am a salesman with one of the largest motor truck manufacturers in the country, and am frequently asked whether or not it is possible to successfully repair giant pneumatic truck tires. I am a reader of THE RUBBER AGE AND TIRE NEWS, and would appreciate any information you can give me on the subject of repairs to cord tires of the sizes used for motor trucks in which there is a growing interest among users.

Answer: As stated by you, the demand for cord pneumatic tires for equipment on motor trucks is growing steadily and rapidly.

It has never been felt that the success of cord tire equipment for trucks depended directly on their susceptibility to repair, but they can be repaired successfully, and this is another strong point in their favor.

The construction of these giant truck tires is essentially the same as that of the smaller cord tires used on passenger cars, except that it contains more layers of parallel cords and has thicker side walls and tread. Repairmen having proper mold equipment can repair such injuries as tread cuts and even cuts in the tread or side walls that have penetrated one or two layers of cord. They can also repair punctures or small cuts and breaks through the carcass. Experience has shown that a very large percentage of the injuries to which a tire is subject come within this range. Very large cuts through the carcass and large breaks cannot be successfully repaired.

Bowers' Customary-Metric Tables*

By George W. Bowers

The article accompanying the first plate of these tables described the standards and the method used in constructing the tables. The arrangement of the gauges contained therein, and a comparison with standard tables was also given. Further examination of the tables shows that the decimal equivalents for metric gauges are for tenths of millimeters. Moving the decimal point one, two or three places to the right will give decimal equivalents for millimeters, centimeters and decimeters, respectively. (This corrects a misprint in the last paragraph of the previous article.)

The conversion of a combined metric weight, width and length into customary equivalents can be accomplished in the following manner. For example, the weight of a sheet of rubber (or other material) is eight hectograms (8/10 kilo) per square meter; thickness and specific gravity not given. Strips are cut from this sheet twenty centimeters (1/5 meter) wide, twelve hundred meters (3,937 feet) long. Required the weight in pounds. These strips will weigh sixteen dekagrams (16/100 kilo) per running meter. Twelve hundred running meters will weigh one hundred and ninety-two (192) kilos. Standard tables give the weight of 192 kilos as being 423.2875 pounds. On referring to the accompanying table, under the "kilos square meter" column, we find .800 or 8/10 kilo. Cross reading at this point to the 10 x 12 column we have .136544 pound. Then changing the decimal point, in the decimal equivalent for 2.0 millimeters two places to the left, we have 7.874 inches for twenty centimeters. Multiplying 3937 by 7.874 times .136544 gives 4232.855 plus. Changing the decimal point one place to the left we have 423.2855 pounds, a variation in weight of about twenty ten-thousandths of a pound from standard tables. This variation will be found to exist throughout the tables owing to the weights given being expressed in only six decimals.

When the gauge and specific gravity of a material are not known but the superficial weight is obtainable, the following will show still further practical use for these tables. A frictioned fabric weighs 1.463 plus pounds per square yard. Required the weight per running foot sixteen inches wide. Cross reading from the pounds square yard column at 1.463163 we have in the 10 x12 column .135478. Then 16 times .135478 equals 2.1696 plus. Changing the decimal point one place to the left gives .21696 pound.

When the gauge and specific gravity of a material are known, the following will show still further practical use for these tables. A rubber sheet has a specific gravity of 1.46, and it is desired to find the weight per running foot sixteen inches wide by one-thirty-second inch thick. Cross reading from 1/32 inch to the 10 x 12 column we have .135478. Multiplying 16 by 1.46 times .135478 gives 3.1647 plus. Changing the decimal point one place to the left gives .31647 pound.

By applying the methods shown in the two preceding examples, it will be found practical to obtain the approximate weight of combinations of treated fabric and compounded material, and then predetermine the material cost without resorting to the building up of samples with the resulting wastage.

By substituting actual weights for those used in these examples, the weights of various composite combinations of fabric and compound can be obtained: cloth inserted packings, also belting of the various constructions; friction surface, coated or with special covers. The same principles can be applied to the obtaining of weights of hose with frictioned fabric centers; the widths, gauges, and specific gravities of the tube and cover being known; also the width and superficial weight of the center being obtainable.

An additional application of these tables can be made in connection with experimental and specification constructions. Assuming that records show that the superficial weights of frictions on a certain fabric are in proportion to their respective specific gravities, it is proposed to use a new recipe in combination with this fabric. As the specific gravity of the new recipe can be approximately obtained by calculation, one can proceed with the dry weight of the fabric as a base; mathematically apply the friction by proportion and the result will be as reliable as that obtained by mechanical process.

* Continued from the Feb. 10, 1919, issue of THE RUBBER AGE AND TIRE NEWS.

Approximate Weights of Sheets—Specific Gravity, 1.00

Stubs Iron or B.W.G.	British Standard 1914	Brown & Sharpe	United States Plate	Fractions of Inch	Millimeters	Decimal Equivalents in Inches	Pounds 10 x12 Inches	Pounds Square Foot	Pounds Square Yard	Pounds Square Meter	Kilos Square Meter
22			23	9-320		.028	.121 388	.145 666	1.310 994	1.567 930	.711 201
						.028 125	.121 930	.146 316	1.316 847	1.574 930	.714 376
		21				.028 46	.123 382	.148 059	1.332 532	1.593 689	.722 885
						.029	.125 723	.150 868	1.357 816	1.623 928	.736 601
						.030	**.130** 059	**.156** 070	**1.404** 637	**1.679** 925	.762 001
						.031	.134 394	.161 273	1.451 458	1.735 923	.787 401
	22		22	**1 32**		**.031** 25	**.135** 478	.162 573	1.463 163	1.749 922	.793 751
					8	.031 496	.136 544	.163 853	1.474 682	**1.763** 697	**.800** 000
		20				.031 96	.138 556	.166 267	1.496 407	1.789 680	.811 785
21						.032	.138 729	.166 475	1.498 279	1.791 920	.812 801
						.033	.143 064	.171 677	1.545 101	1.847 918	.838 201
						.034	.147 400	.176 880	1.591 922	1.903 915	.863 601
			21	11 320		.034 375	.149 025	.178 831	1.609 480	1.924 914	.873 126
	21					.034 9	.151 301	.181 562	1.634 061	1.954 313	.886 461
20						**.035**	**.151** 735	**.182** 082	1.638 743	1.959 913	.889 001
					.9	.035 433	.153 612	.184 335	1.659 017	**1.984** 160	**.900** 000
						.035 89	.155 593	.186 712	1.680 414	2.009 750	.911 607
		19				.036	.156 070	.187 284	1.685 564	2.015 910	.914 401
						.037	.160 406	.192 487	1.732 386	2.071 908	.939 801
			20	3 80		.037 5	.162 573	.195 088	1.755 796	2.099 906	.952 501
						.038	.164 741	.197 689	1.779 207	2.127 905	.965 201
						.039	.169 076	.202 892	1.826 028	2.183 903	.99; 601
						.039 2	.169 943	.203 932	1.835 392	2.195 102	.995 681
	20				1.0	.039 37	.170 680	.204 816	1.843 352	**2.204** 622	**1.000** 000
						.040	**.173** 412	**.208** 094	**1.872** 849	**2.239** 900	1.016 002
						.040 3	.174 712	.209 655	1.886 896	2.256 700	1.023 622
		18				.041	.177 747	.213 296	1.919 671	2.295 898	1.041 402
						.042	.182 082	.218 499	1.966 492	2.351 895	1.066 802
19						.043	.186 417	.223 701	2.013 313	2.407 893	1.092 202
					1.1	.043 307	.187 748	.225 298	2.027 687	**2.425** 084	**1.100** 000
						.043 75	.189 669	.227 603	2.048 429	2.449 891	1.111 252
			19	7 160		.044	.190 753	.228 903	2.060 134	2.463 890	1.117 602
	19					**.045**	**.195** 088	**.234** 106	2.106 956	2.519 888	1.143 002
		17				.045 26	.196 215	.235 458	2.119 129	2.534 447	1.149 606
						.046	.199 423	.239 308	2.153 777	2.575 885	1.168 402
				3 64		**.046** 875	**.203** 217	.243 860	2.194 746	2.624 883	1.190 627
						.047	.203 759	.244 510	2.200 598	2.631 883	1.193 802
					1.2	.047 244	.204 816	.245 780	2.212 023	**2.645** 546	**1.200** 000
						.048	.208 094	.249 713	2.247 419	2.687 880	1.219 202
18						.049	.212 429	.254 915	2.294 241	2.743 878	1.244 602
						.049 5	.214 597	.257 516	2.317 651	2.771 877	1.257 302
	18					**.050**	**.216** 765	**.260** 118	**2.341** 062	**2.799** 875	1.270 002
			18	1-20		.050 82	.220 319	.264 383	2.379 455	2.845 793	1.290 830
		16				.051	.221 100	.265 320	2.387 883	2.855 873	1.295 402
					1.3	.051 181	.221 885	.266 262	2.396 358	**2.866** 008	**1.300** 000
						.052	.225 435	.270 522	2.434 704	2.911 871	1.320 802
						.053	.229 770	.275 725	2.481 526	2.967 868	1.346 202
						.054	.234 106	.280 927	2.528 347	3.023 866	1.371 602
						.055	**.238** 441	**.286** 129	2.575 168	3.079 863	1.397 002
					1.4	.055 118	.238 953	.286 743	2.580 693	**3.086** 471	**1.400** 000
						.055 6	.241 042	.289 251	2.603 261	3.113 462	1.412 242
	17					.056	.242 776	.291 332	2.621 989	3.135 861	1.422 402
			17	9-160		.056 25	.243 860	.292 632	2.633 695	3.149 860	1.428 752
						.057	.247 112	.296 534	2.668 811	3.191 858	1.447 802
		15				.057 07	.247 415	.296 898	2.672 088	3.195 778	1.449 580
						.058	.251 447	.301 736	2.715 632	3.247 856	1.473 202
17						.059	.255 782	.306 939	2.762 453	3.303 853	1.498 602
					1.5	.059 055	.256 021	.307 225	2.765 028	**3.306** 933	**1.500** 000
						.060	**.260** 118	**.312** 141	**2.809** 274	**3.359** 851	1.524 003
						.061	.264 453	.317 344	2.856 096	3.415 848	1.549 403
						.062	.268 788	.322 546	2.902 917	3.471 846	1.574 803
	16		16	**1 16**		**.062** 5	**.270** 956	.325 147	2.926 327	3.499 844	1.587 503
					1.6	.062 992	.273 089	.327 707	2.949 364	3.527 395	**1.600** 000
						.063	.273 123	.327 748	2.949 738	3.527 843	1.600 203
						.064	.277 459	.332 951	2.996 559	3.583 841	1.625 603
						.064 08	.277 806	.333 367	3.000 305	3.588 321	1.627 635
		14				**.065**	**.281** 794	**.338** 153	3.043 381	3.639 838	1.651 003
16						.066	.286 129	.343 355	3.090 202	3.695 836	1.676 403
					1.7	.066 929	.290 157	.348 188	3.133 699	**3.747** 857	**1.700** 000
						.067	.290 465	.348 558	3.137 023	3.751 833	1.701 803
						.068	.294 800	.353 760	3.183 844	3.807 831	1.727 203
						.069	.299 135	.358 962	3.230 666	3.863 828	1.752 603
	15					.0699	.303 037	.363 645	3.272 805	3.914 226	1.775 463
						.070	**.303** 471	**.364** 165	**3.277** 487	**3.919** 826	1.778 003
			15	9-128		.070 3125	.304 825	.365 791	3.292 119	3.937 325	1.785 941
					1.8	.070 866	.307 225	.368 670	3.318 034	**3.968** 320	**1.800** 000
						.071	.307 806	.369 367	3.324 308	3.975 823	1.803 403
						.071 96	.311 968	.374 361	3.369 256	4.029 581	1.827 787
		13				.072	.312 141	.374 569	3.371 129	4.031 821	1.828 803
15						.073	.316 476	.379 772	3.417 951	4.087 818	1.854 203
						.074	.320 812	.384 974	3.464 772	4.143 816	1.879 603
					1.9	.074 803	.324 293	.389 152	3.592 369	**4.188** 782	**1.900** 000
						.075	**.325** 147	**.390** 177	3.511 593	4.199 813	1.905 003
						.076	.329 482	.395 379	3.558 414	4.255 811	1.930 403
						.077	.333 818	.400 581	3.605 236	4.311 809	1.955 803
						.078	.338 153	.405 784	3.652 057	4.367 806	1.981 203
			14	**5-64**		**.078** 125	**.338** 695	.406 434	3.657 910	4.374 806	1.984 378
	14					.078 5	.340 321	.408 385	3.675 467	4.395 805	1.993 903
					2.0	.078 740	.341 361	.409 633	3.686 705	**4.409** 244	**2.000** 000
						.079	.342 488	.410 986	3.698 878	4.423 804	2.006 603
						.080	**.346** 824	**.416** 188	**3.745** 699	**4.479** 801	2.032 004
						.080 81	.350 335	.420 402	3.783 625	4.525 159	2.052 578
		12				.081	.351 159	.421 391	3.792 521	4.535 799	2.053 404
						.082	.355 494	.426 593	3.839 342	4.591 796	2.082 804
					2.1	.082 677	.358 429	.430 115	3.871 040	**4.629** 706	**2.100** 000

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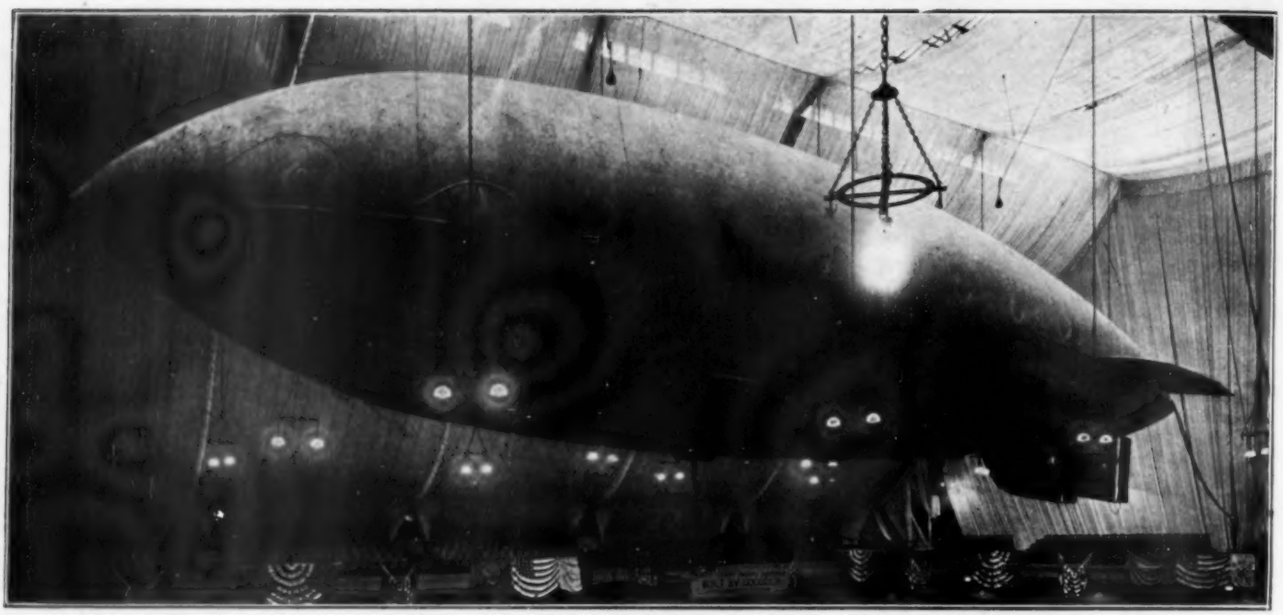

Rubber Products at the Aeronautical Exposition

The Aeronautical Exposition, which opened in New York City on March 1, and which will continue until March 15, offers to the American public its first opportunity to gauge the huge effort made by this country to gain supremacy of the air, and also the vitally important role played by our rubber industry in this achievement. Among the most attractive, interesting and instructive features of the Exposition are the exhibits of Akron's two largest rubber manufacturers: The B. F. Goodrich Company and the Goodyear Tire and Rubber Company.

The Aeronautical Exposition is divided between the Madison Square Garden and the Sixty-ninth Regiment Armory, and the large lighter-than-air constructions of these two companies dominate the exhibits in both buildings.

At the Garden, the visitors' eyes are immediately centered on a 35,000-cubic feet naval kite baloon, a Goodyear product, which floats at anchor, fully equipped, under the huge arched roof of that well-known building.

At the Armory, it is an 80,000-cubic foot naval "Blimp," 136 feet long that dominates the exposition. This dirigible, built by The B. F. Goodrich Company, belongs to the United States Navy, and has seen more than nineteen months of active service in coast patrolling and convoying troop ships; a remarkable achievement, for the active life of dirigibles of this type is seldom more than nine months, and this particular one is still in perfect condition and good for many more days of cruising.

Goodyear Exhibits

The Goodyear Tire & Rubber Company is not a new-comer in aeronautics. In fact, it is a pioneer in this field and has been constantly engaged in the manufacture of aeronautic supplies since 1910.

When the United States entered the war the Goodyear pushed its aeronautical department to the limit, turning over many floors of its large factory buildings to the manufacture of airplane cord fabric tires, inner tubes, rims, wheel windshield discs, balloon and airplane fabrics, balloons, aircraft, gasoline hose, hot oil resisting hose, water outlet pipe hose, gas tank filling hose, pure gum tubing, red gas hose, aircraft radiator shutter support pads, washers for gasoline lines, speedometer shaft guards, shock absorber rub-

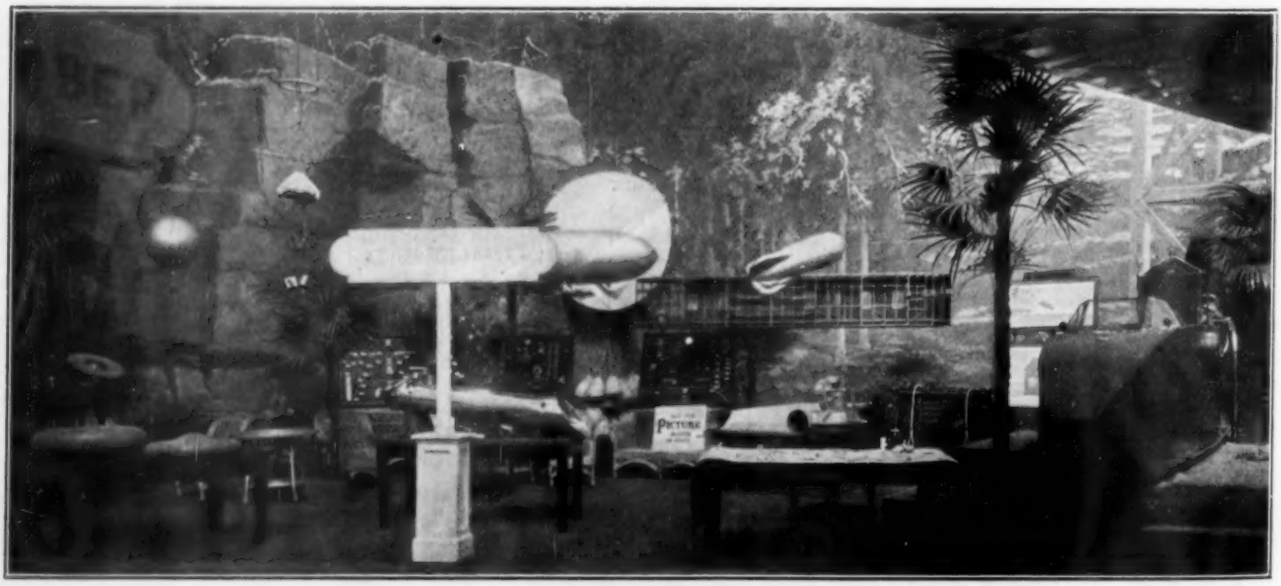

EXHIBIT OF THE GOODYEAR TIRE & RUBBER COMPANY AT MADISON SQUARE GARDEN

ber, instrument board and control wheel bumpers, tail skid bumpers, starting crank bumpers, wing nose incidence indicator guard wire, starting crank rests, upper bumpers for airplane landing gear axles, recoil absorbers for landing gear axles, elastic cords, special rubber matting, wire streamling strips and other mechanical rubber goods used on airplanes and balloons.

All these products are neatly exhibited on display boards and in glass cases at the Goodyear booth in the Madison Square Garden.

Feature of more than passing interest at this booth is a dirigible balloon car equipped with a motor and pusher propellor, models of twin-engined dirigibles and of a "trans-continental" passenger dirigible, a balloon fabric inspection table, balloon sections showing features of construction, such as the Goodyear "finger-patch," balloon valves and the lack. An outstanding feature is a section of balloon hull with a "finger-patch" supporting a weight of several thousand pounds. The object being to demonstrate the immense strength of these patches.

The Goodyear exhibits are in charge of E. R. Preston, manager of Government sales of the Goodyear Tire & Rubber Company, who is assisted by Willard P. Seiberling, son of F. A. Seiberling, president of the company. Other Goodyear representatives present during the first week were, G. M. Kurtz, chief aeronautical engineer; R. H. Upson, chief Goodyear pilot, and his assistant, H. T. Kraft.

Goodrich Exhibits

The booth of The B. F. Goodrich Company is in the Sixty-ninth Regiment Armory, where it is one of the chief centers of attraction.

When America entered the war, The B. F. Goodrich Company had had little or no previous experience in aeronautics, but its organization knew rubber and its possibilities, secured the best available aeronautical skill from the outside, and was soon manufacturing aeronautical products that played a major part in the vital work of convoying our troop ships through danger zones and in assisting our armies in training and at the battlefront.

During the war The B. F. Goodrich Company built no less than 389 balloons. Fourteen of these were dirigibles of the "Blimp" type, 362 were kite or observation balloons, and 13 were supply balloons. The largest "Blimp" produced was 200 feet long and 42 feet in diameter. It had a capacity of 191,000 cubic feet and was driven by two 150-h.p. motors at a speed of 50 miles per hour.

Features at the Goodrich booth are a moving picture device displaying animated views of the building of balloons and aeronautical supplies at the Akron factories; Gaumeter balloon valves, and parachute releases, invented by John Gaumeter of the Goodrich engineering staff various types of improved attachment patches, Silvertown cord airplane tires; inner tubes and rubber shock absorber cords for airplanes.

An idea of the achievements of The B. F. Goodrich Company in the production for war purposes can be obtained from the following facts.

During America's participation in the war, the Goodrich produced, besides the 389 balloons, before mentioned, and thousands of 'Silvertown Cord' airplane tires, over a million and a half feet of airplane shock absorber cord, thousands of yards of rubberized fabrics for balloons and airplanes, numerous accessories to aircraft, such as the Gaumeter valve, parachute releases, various improvements in balloon manhole flanges, gaskets, glands, 55,000 complete gas masks, 650,000 mask face pieces, 8,000,000 mask parts, 13,047,831 rubber mechanical and surgical articles, 50,000 raincoats and ponchos, over 800,000 pairs of hubber footwear, 50,000 feet of rubber tubing, 1,500,000 feet of rubber hose, 25,000 feet of rubber belting, vast numbers of tires for motor trucks, automobiles, motorcycles and bicycles, rubber mechanical goods, packing, matting and the like for naval vessels, and hard rubber battery jars for submarines and tanks.

THE B. F. GOODRICH COMPANY EXHIBIT AT SIXTY-NINTH REGIMENT ARMORY

Miller Has Big Year

The board of directors of the Miller Rubber Company, Akron, Ohio, was re-elected and all other officers reappointed at the annual meeting of the company. Charles E. Wetzell was made assistant secretary. Inability of the auditor to submit a report made it necessary to omit the annual statement. It was stated, however, that the gross sales during 1918 amounted to more than $16,000,000, which would amount to a 45 per cent increase over the showing for 1917.

Federal Rubber Plans Addition

The Federal Rubber Company, Cudahy, Wis., manufacturers of tires and mechanical rubber goods, has had tentative plans prepared for the erection of a 6-story, 250 x300-foot addition to its plant. A. A. Frank is general manager of the Federal Rubber Company.

General Tire Appointments

Thomas I. Moore has been appointed Southwestern district manager for the General Tire & Rubber Company, Akron, Ohio, with headquarters at Dallas, Tex.

The same company has appointed A. M. Whaley its Southern sales manager, with headquarters at Atlanta, Ga.

Secretary Redfield Explains His Plan

Secretary Redfield's plan for the "readjustment of prices" to stimulate consumption and keep labor employed has reached the stage where it has been given an official name. It is to be carried out by "The Industrial Board of the Department of Commerce."

The exact make-up of the board, however, is not to be made public until later in the week, as half of the members have not yet accepted their commissions. It is to be made up of six members. As already announced, George N. Peek, former vice-chairman of the War Industries Board, is to be chairman of the new commission. The two "Government" members are to be Hugh Frayne, who represented the labor interests on the old War Industries Board, and Thomas C. Powell, Director of Capital Expenditures of the Railroad Administration. The addition of Mr. Powell to the commission foreshadows the likelihood that the commission will attempt to bring the railroads into the steel market. If it can succeed in doing this it will have accomplished a most important task. Chairman Baruch of the War Industries Board tried to do this last fall, at the time of the signing of the armistice, when the steel industry pointed out the importance of an increased purchasing program by the railroads. Then, however, Director General McAdoo declined to urge the railroads to buy, suggesting the possibility of lower prices later. Whether the new commission can find a price basis that will stimulate this particular class of buying is of great interest to the whole industrial world.

Will Not Readjust Wages

So far, however, there is nothing in any of the various announcements concerning the activity of the new commission which indicates that it will attempt to readjust wage rates. As much of the purchasing of steel by the railroad companies, especially rails, depends upon the cost of laying the rails and the general wage cost of making extensions, the importance of this factor cannot be overestimated.

Laying Foundation for Resumption

"Through proper investigation and stabilization," declared the initial announcement of the new commission, it is expected that the foundation can be laid for the resumption of American business and for the furnishing of employment to returning soldiers and sailors—this through Government purchases, the publication of fair price lists and co-operation of the producer.

"To obtain this co-operation of the producer it is planned that the board shall call the various leaders of industry into consultation. The first of these conferences will be with representatives of industries producing basic materials, such as iron, steel, lumber, textiles, cement, copper, brick and other construction material.

"It will be the endeavor of the board to interchange views with these representatives of industry in the fullest and freest manner possible. If these conferences result in a general agreement among the important basic industries upon proper prices and bases for prices at which sales will be made and this agreement is approved by the board, it is believed that the announcement of this fact will induce the nation to feel justified in properly beginning a buying program."

Secretary Redfield's Analysis

At the same time, Secretary Redfield gave out the following statement of the "General Conditions" which he believed to underlie the work ahead of the new commission:

1. There exists at the present time an abnormal situation in the industrial world. It is a condition of stagnation of business and industrial activity. Mills and factories are idle or are producing but a small part of what they are capable of doing; building operations, now deferred for several years, are not beginning—and, in fact, resumption is not contemplated until the confused condition of the transition period are clarified. Many enterprises, such as street railway companies in various municipalities, laboring under restrictions of charter contracts, are confronted with advanced wage scales and unprecedented prices of materials needed for repairs and necessary extensions. Unemployment exists and this unemployment is increasing at such a rate as to challenge the best thought that can be given to the situation.

2. One of the striking features of the present situation is the high prices demanded for practically all articles and commodities of trade and commerce. This high price condition is undoubtedly the cause of most of the business inactivity, and, therefore, also is the cause of the widespread unemployment of labor.

3. The living costs of the present are unusually high and will continue high until there are substantial reductions in the cost of the necessary staple food stuffs.

4. A large and, it is believed, satisfactory latent buying power exists in the country—an abundance of money—but it is not being used to employ labor and to purchase goods and materials.

5. The present conditions have come about by a series of unusual happenings due to the war. The industries and labor of the country were diverted into new and unnatural channels in order to mobilize all efforts possible in the winning of the war.

The capacities of many factories were expanded, new ones built, abandoned plants remodeled and put into production, and industry was managed and operated in accordance with war necessities. This control and direction of effort and change of policies resulted in the complete suspension of the ordinary operation of the law of supply and demand, the demand for war commodities and the necessary agreements with industries as to prices and terms of conversion of industry to war work, etc., had the effect of inflating prices to an abnormal extent, so as to encourage maximum production, even by producers operating under the greatest handicaps and at the highest costs. Prices were advanced disproportionately, some articles showing increase in selling prices over pre-war prices of 250 per cent, while others showed but approximately 50 per cent. The law of supply and demand is really inoperative at the present time, for the reason that it is found difficult, if not impossible, for this law to resume normal functioning, on account of the fact that at the present time the price relations between the industries producing basic essentials are out of balance and not properly adjusted to efficiently meet peace time conditions.

6. It, therfore, is apparent that the trouble resulting in the present stagnant, unsatisfactory condition of industry is due to the continuance of the high, uneven, unstable prices of war times, which were, in many instances, agreed to by agencies of Government functioning for war purposes and not to any unhealthy general condition. These abnormal prices still remain because there has been provided, up to this time, no agency to bring about the necessary reductions.

Solution of the Problem

Secretary Redfield, in an official statement, also itemized "some suggestions" which he said ought to be observed in seeking a solution of this problem. This summary follows:

1. A wise solution is equally important to the Government, to industry, and to labor, for their true interests are so indissolubly connected and united that no detriment can be suffered by one without a harmful effect and reaction upon the others.

2. The vital need of the situation is resumption of industrial activity to the fullest extent possible, and it should be the aim to find the wisest and most effective way to accomplish this.

It is felt that the proper basis of selling prices for the present will be found to be upon a scale higher than those of the pre-war days. However, the level should be established on the lowest plane possible, having due regard for industry, labor and Government. The announcement of such a plane of prices will immediately create confidence in the buying public.

4. It is believed that the reductions from the high prices to the proper level, so that consumers may be justified in buying, should be made at once by one reduction.

The effort should be to wholly eliminate the abnormal, unbalanced stimualtion that business has had and the inflated prices that have resulted, and to start anew upon a normal level, and thereafter, industry, having adopted that level, can safely rely upon the law of supply and demand to govern future values. Such a policy adopted and announced will, it is believed, when understood by the consumers, induce at once sufficient buying to start factories, fill empty yards and warerooms, and to inaugurate the interrupted building and other programs.

5. Industry and labor have a mutual interest in remedying present conditions, but industry should take the first step by the reduction of prices of commodities and should require of labor only reasonable aid.

Called a Simple Program

For these difficulties Secretary Redfield outlined the following procedure as a remedy:

1. It is believed that a remedy for these conditions can be had by a comparatively simple program. As the President has approved my appointing a board which will make a study of the subject and take action thereon and as it will be made plain that the Department of Commerce and its board has the support of the President, there can be no doubt that industry generally will be glad to co-operate with the board in an endeavor to arrive at a solution of the difficulties.

2. Therefore, one of the first steps which the board should take would be to call into consultation and conference the leaders of industry in such numbers and by such groups as it may be felt is wise. Probably the first of these conferences should be with representatives of industries producing basic materials, such as iron, steel, lumber, textiles, cement, copper, brick, and other construction materials, and from time to time thereafter such others as may be deemed proper. It is believed, however, that industries dealing in finished products will be able to largely (if not entirely) adjust their prices in line with the above policy, without material aid from the committee.

3. At such conferences, the general situation or conditions outlined above and as they may change up to the time of the conference, should be considered and carefully understood, and the above-mentioned principles which ought to apply and govern the solution of the problems should also be fully understood and appreciated. It is believed that these principles and views will be readily accepted by the great majority of those called into conference, and further that if any of those who come into conference question these principles and views, a discussion thereof in the conference will, without any considerable delay, lead to a unanimous acceptance thereof.

4. In addition to giving assistance to industry in reaching satisfactory price bases, the board ought to be able to give valuable advice in regard to such questions as the disposal of surplus war materials, it being desirable to accomplish this in such a way as to have as little detrimental effect as possible upon private industrial activities.

It will be the endeavor of the board to act promptly by consulting and interchanging views with these representatives of industry in the fullest and freest manner possible, with a view to aiding and assisting industry in general to resume activities to the fullest practicable extent. The immediate object is to bring about such reduced prices as will bring the buying power of the Government itself, including the railroads, telephones and telegraphs, into action and make it possible for the Government to state that it is willing to be a buyer for its needs at the reduced prices. If these conferences result in such an understanding on the part of the Government with respect to the important basic industries concerning proper prices and bases for prices at which purchases may be made by it, and these are approved by the board, it is believed that upon announcement thereof to the country in general the public will feel justified in promptly beginning a program of extensive buying.

Such a procedure will in substance establish immediately a basis upon which to resume activities, and in this way the law of supply and demand will be enabled to come into play and from that time forward it will control the changes and readjustments in selling prices of materials and the trend of prices, it is believed, will be upward and not downward.

L. D. GARDNER, PRESIDENT
W. D. MOFFAT, VICE-PRESIDENT
W. I. SEAMAN, TREASURER

THE RUBBER AGE AND TIRE NEWS

W. M. MILNER, EDITOR
H. M. WILLIAMS, GENERAL MANAGER
H. B. SEYMOUR, BUSINESS MANAGER

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THE new revenue law, like its predecessor, affects everybody in some way, especially through its excise provisions and the income and excess profits taxes. Specifically and jointly tire men are interested, and indeed in some degree puzzled over those provisions of the law relating directly to motor vehicles and tires. These for the most part are reasonably clear in their wording, but even so, there are points that require interpretation.

On behalf of the tire industry, G. M. Stadelman, chairman of the Pneumatic Tire Division of the Rubber Association of America, caused Charles Neave, counsel for the Association, to prepare an opinion in regard to the various provisions of the War Revenue Law and their effect on the tire industry. Mr. Neave's opinion is published elsewhere in this issue of THE RUBBER AGE AND TIRE NEWS.

The new law continues the 3 per cent tax placed, as a war revenue measure, on the manufacturers' selling price for "automobile trucks and automobile wagons," and adds a provision that all tires, parts and accessories sold on or in connection with motor trucks and wagons are considered part of them in estimating the tax. On the manufacturers' selling price of passenger cars, the law increases the tax to 5 per cent with the same provision affecting tires. There is a similar 5 per cent tax on motorcycles and motorcycle tires but no tax on tractors or tractor tires.

The same tax of 5 per cent applies to the manufacturers selling prices of tires when they are sold separately, but tires sold to automobile or motorcycle manufacturers are not taxable as far as the tire manufacturer is concerned. In addition to the taxes on manufacturers' tire sales, there are taxes at the same rates on the leasing of tires by their manufacturers.

The tax situation regarding tire exporting is changed, so that tires "sold or leased for export, or in due course exported" are not subject to taxation. This is in compliance with the Federal Constitutional provision against taxes on exports.

Another provision of importance to the tire trade is that tires that were bought in good faith prior to February 25 are not subject to taxation. In other words tire dealers who placed their orders prior to that date will receive their tires tax free.

Still another feature of the War Revenue Law, one that in most cases no doubt has escaped the eye running over the bill for the first time, is the way it affects bus, motor freight and express lines that can be construed as operating in competition with the railroads. Passenger carrying lines of this nature will have to carry an eight per cent tax, while freight lines must sustain a tax of three per cent on their schedules. The tax on express matter handled in competition with the railroads is one cent for each 20 cents charged. However, it is not probable that these provisions will affect rural express lines that do not compete with railroads.

Manufacturers required by the new law to report on their outputs monthly, have been advised that they need not report separately on the three last days of February, but should include these in their March report.

Many special cases will no doubt arise under this new tax law and have to be decided upon by the Revenue Bureau. However, the wording of the new law quite closely follows that of its predecessor, so that most of the general rulings of the Revenue Bureau in the previous law will apply to the present one.

General Business Conditions

Though no clear evidence has as yet appeared to show that business in general is coming out of the state of inactivity that followed the signing of the armistice, a change for the better is slightly discernible in that a gain in actual transactions has come in certain lines where price reductions have been sufficiently important to awaken the buyers' interest. This development, particularly true in the case of textiles, gives more tangible reason to anticipate economic revival as market deflation continues. There is every indication that buyers will continue to hold fast to their policy of purchasing cautiously, and only for immediate necessities. The retail trade is active, and according to some authorities, should soon absorb the present available supplies of merchandise.

In commercial circles a good deal of attention is being directed to the delay in developing export business.

As international trade is more or less controlled by the relative price-planes of America and Europe, it is important to consider this feature in connection with the present state of the foreign trade. European commodity prices are now higher than American prices, in fact far above the average price-difference which has prevailed since 1900. The discount rate on foreign exchange and the lack of ocean tonnage now tend to check exports, but in these directions gradual improvement can be expected and this in connection with the general shortage of merchandise in the old world should bring about a corresponding betterment of the export demand for American products.

Happenings of Interest to Rubber Men

Goodrich Has Remarkable Year—Obalski and Sweeney Separate—Burrell Becomes Wellman-Seaver-Morgan Vice-President—Rubber Association to Have Big Income

Goodrich Doubled Its 1917 Surplus

Net earnings of the B. F. Goodrich Rubber Company, New York City, were approximately 45 per cent greater in 1918 than in the year preceding. This is revealed in an accounting of the company's year made public this week. In that statement is confirmed earlier news to the effect that Goodrich net sales for the year reached $123,470,188, nearly 40 per cent over the mark reached in 1917. Net income for the year was $21,610,323, as compared with $15,220,277 for 1917, and net profit $15,637,115, as compared with $10,544,678 for the earlier year. Included in the deductions for 1918 were a depreciation charge more than double that of 1917, $2,428,226 and $1,092,456, respectively. For reducing plant additions made during the war to their value on a pre-war basis an additional $1,447,540 is reserved, and $104,411 is set aside to reduce Liberty Bonds from the price paid for them to their present market value.

BALANCE SHEET, DEC. 31

ASSETS	1918.	1917.
Plant, goodwill....	$74,859,587	$76,381,661
Investments other companies	2,020,487	1,230,469
Treasury stock ...	930,700	865,700
French companies..	3,185,876	3,179,533
Inventory	34,965,692	50,735,871
Accounts received .	12,570,609	10,070,067
Bills received	130,796	119,553
Liberty bonds	5,784,656	.....
Cash	6,343,766	2,573,804
Deferred sharings...	446,258	970,588
Total	$141,238,427	$146,127,246
LIABILITIES		
Preferred stock.....	$25,500,000	$26,400,000
Common stock	60,000,000	60,000,000
Bills payable	.....	14,349,266
Accounts payable ..	1,248,032	1,460,896
Accrued liabilities..	522,868	589,705
Security notes	15,000,000	15,000,000
Tax reserve	.....	2,250,000
Other reserve	†3,847,540	2,300,000
Appropriation for preferred stock...	4,500,000	3,600,000
Surplus	*30,619,987	20,177,379
Total	$141,238,427	$146,127,246

* Before war taxes.

† Comprises excess cost of plant over pre-war values $1,477,540, contingencies $2,000,000, and pensions $400,000.

Surplus for the year was $10,442,609, nearly twice that of 1917, which was $5,257,491. This brings the Goodrich surplus account to $35,119,987 after deducting $4,500,000 applied from the surplus to redemption of preferred stock.

Outstanding in the balance sheet is a condition revealed in a comparison of the inventory item with that for 1917. In the later statement inventories are reduced to $34,965,692 from $50,735,871 of the earlier statement.

Obalski and Sweeney Separate

E. C. Sweeney, Jr., and N. W. Obalski announce that pursuant to an agreement between them, they are dissolving the corporation Obalski & Sweeney, Inc., New York City, and are winding up its business.

N. W. Obalski will open an office at 291 Broadway, New York City, where he will conduct the business of importer and dealer in crude rubber.

E. C. Sweeney, Jr., will remain at the former place of business of Obalski & Sweeney, Inc., 59-61 Pearl Street, New York City, where he will also conduct the business of importer and dealer in crude rubber.

G. W. Burrell W. S. M. Vice-President

George W. Burrell, who was elected second vice-president of the Wellman-Seaver-Morgan Company, builders of rubber machinery and equipment, at the annual meeting of stockholders in Cleveland February 18, has been in the continuous employ of that company for 21 years, having become affiliated in 1898 as a draftsman. He has occupied the following other positions: Inspector, chief inspector, assistant purchasing agent, assistant secretary, assistant works manager, manager of works. He will now have entire charge of the company's works, both at Cleveland and at Akron. He was born in 1871 and attended the Cleveland public schools, which he left at the age of 14 to learn the machinist's trade. He worked in machine shops for five years, during which time he studied nights in preparation for college. In 1891 he entered Ohio State University, where he took a three years' course in mechanical engineering.

G. W. BURRELL

The stockholders of the Wellman-Seaver-Morgan Company re-elected the following board of directors: Edwin S. Church, F. E. Borton, W. H. Cowell, F. B. Richards, S. T. Wellman, E. H. Whitlock of Cleveland, S. H. Pitkin, Francis Seiberling and F. A. Seiberling of Akron. The directors elected the following officers: Edwin S. Church, president and general manager; S. H. Pitkin, vice-president; George W. Burrell, second vice-president; W. H. Cowell, secretary and treasurer.

Dural Enlarging Plant

The Dural Rubber Corporation, Flemington, N. J., is planning the construction of a new unit for its plant to take care of its production of tubes and other rubber goods. A new office building will also be constructed.

D. J. MacNichol Joins Hood Tire Sales Co.

D. J. MacNichol has become the president and general manager of the Hood Tire Sales Company, Boston, Mass. Mr. MacNichol was formerly asociated with the Critchfield Company, Chicago, Ill.

Additional Income for R. A. A.

Manufacturers representing approximately 90 per cent of the crude rubber consumption of the United States have signed the agreement to pay to the Rubber Association of America three cents per 100 pounds on all crude rubber consumed by them according to the plan outlined in the January 25 issue of THE RUBBER AGE AND TIRE NEWS.

The Executive Committee of the Association has voted to make the plan operative as of March 1st, 1919, and to inform the trade accordingly. Harry S. Vorhis, Secretary of the Rubber Association, has also been instructed to furnish all crude rubber importers and dealers with a list of manufacturers who have signed the agreement.

In connection with the above it is to be noted that the Directors of the Rubber Trade Association of New York (the crude rubber importers' and dealers' organization) at a meeting held on February 25 last adopted a resolution recommending that all crude rubber importers and dealers undertake to look after the collection of the charge from manufacturers who signed the agreement and make reports together with payments to the Rubber Association monthly.

The Trenton Rubber Manufacturers' Association, Trenton, N. J., also voted unanimously on February 10 last in favor of the proposition to pay three cents per 100 pounds on all crude rubber consumed by them to the Rubber Association of America.

The plan, therefore, will be in full force and effect on March 1st, and the Executive Committee of the Rubber Association wishes to extend thanks for the very hearty support voluntarily rendered by so large a percentage of members. It is hoped that eventually 100 per cent of the members of the Rubber Association will have signed this agreement.

National Aniline & Chemical's Annual Election

At the annual meeting of stockholders of the National Aniline & Chemical Company, Inc., New York City, on Monday, February 17, and at the succeeding meeting of the directors on Wednesday, February 19, the officers and Board of Directors were elected as follows: President and Chairman of the Board, William J. Matheson; Vice-Presidents, Dr. William Beckers, Robert Alfred Shaw and Dr. L. C. Jones; Acting Treasurer, William H West; Assistant Treasurers, H. S. Trott and T. S. Baines; Secretary, William T. Miller; Assistant Secretary, Walter E. Rowley; Chairman of Executive Committee, Henry Wigglesworth.

The personnel of the Board is as follows: Dr. William Beckers, New York; H. H. S. Handy, Syracuse; Dr. L. C. Jones, Syracuse; Clinton S. Lutkins, New York; William J. Matheson, New York; Eugene Meyer, Jr., New York; W. N. McIlravy, New York; F. M. Peters, New York; T. M. Rianhard, New York; Robert Alfred Shaw, New York; I. Frank Stone, New York; Dr. R. C. Taggesell, Buffalo; Orlando F. Weber, New York; Henry Wigglesworth, New York.

"Cy" Falkinberg Joins Vorhees

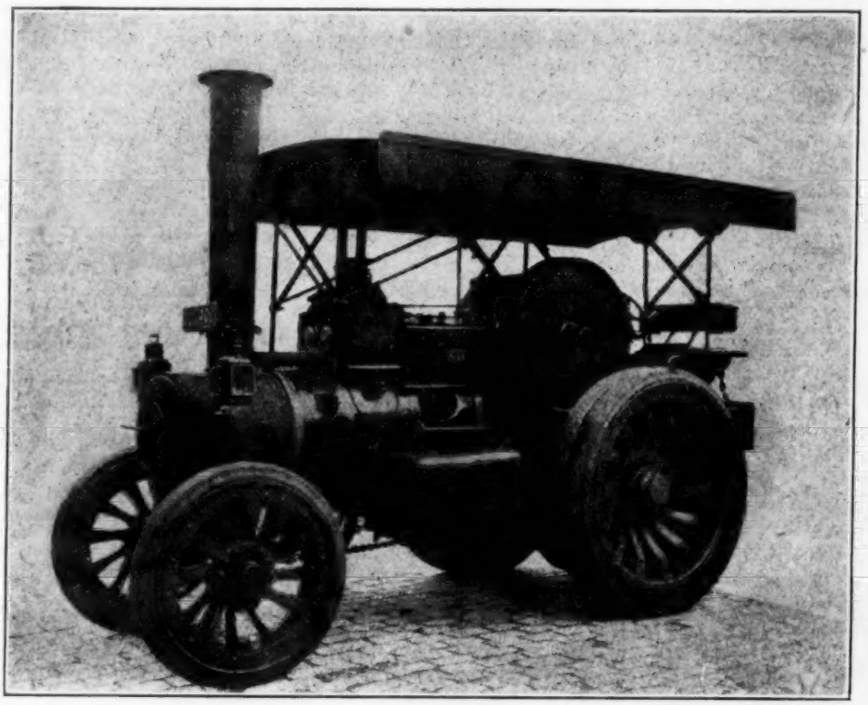
A. L. Falkinberg, popularly known in the trade as "Cy," and for the past five years with the Sparks-Withington Company, has resigned to accept a position with the Voorhees Rubber Manufacturing Company, Jersey City, N. J. His headquarters will be at Jackson, Mich., and he will represent the Voorhees company in Northern Ohio and Michigan.

TIRE NEWS

British Road Committee Report on Solid Tires

The Report of the British Departmental Committee which has been considering the law and regulations relating to the construction and use of road vehicles and heavy motor cars has just been published. It is a lengthy document dealing with such matters as the weight of locomotives, construction of wheels, springs, etc., maximum speed limits, restriction of traffic on unsuitable roads, lifeguards, splash guards, licensing of omnibuses, and so on. Among the recommendations is that the minimum diameter for wheels of heavy motors, fitted with iron, steel, or other band tires, be raised from 2 ft. to 2 ft. 9 in., and a scale of minimum diameters be prescribed according to the registered axle weight, where the registered axle weight exceeds four tons.

What is chiefly of interest to the rubber industry is the section under Heavy Motor Cars headed "Rubber Tires."



BRITISH STEAM TRACTOR WITH FIVE AND A HALF-INCH SOLID TIRES

Pneumatic Tires

Pneumatic tires are quickly disposed of. The Heavy Motor Car Order, it is stated, contains no regulation with regard to the shape or size of a pneumatic tire, or of a "tire made of a soft or elastic material," or with regard to the size of a wheel fitted with such a tire. The use of pneumatic tires on heavy motors is ordinarily limited to cases where the axle weight would not exceed 2 tons approximately, and there are practical difficulties in the way of the use of such tires for heavier axle loads, according to this report. The evidence collected by the Committee does not suggest that any special regulation is required, in the interests of the roads, respecting either the pneumatic tire itself or the diameter of the wheel.

Solid Tires and Road Damage

The position is very different with regard to the solid rubber tire, and the serious damage caused to the roads by this class of tire makes it, in the opinion of the Committee, essential to consider whether some regulation cannot be made to lessen the damage. The main advantage possessed by the solid rubber tire over the iron or steel tire consists in the yielding character of the rubber, which not only enables the weight on the wheel to be spread over a very much larger area of road surface, but also lessens the force of the impact, thus reducing the strain upon the road. From figures supplied the Committee it would seem that the weight pressure per square inch of tire exerted by the solid rubber tire of a fully-loaded vehicle varies between 1 cwt. and 2 cwt., and that the corresponding pressure of the iron or steel tire is not less than 10 cwt., and is frequently much greater. This advantage is, however, to some extent counteracted, especially on waterbound macadam roads, by the damaging effect on the road surface due to the expansion and contraction of the solid rubber tire as it passes over the road, and by the greater speed of the rubber-tired vehicle. The broad iron or steel tire does not sink into the small depressions which form in a waterbound macadam road when subjected to heavy traffic; such a tire tends rather to flatten out these depressions. The solid rubber tire, on the other hand, sinks into the depressions, forces out any loose material, and has the effect of widening and deepening the depressions. A hollow thus formed imparts an upward impetus to the rubber-tired wheels as it emerges, and the wheel comes down with increased force upon a point beyond the hollow, where the formation of another depression is begun.

Two and One-Half Feet Minimum Diameter

The considerations which render necessary the use of wheels of larger diameter for iron and steel tired motors apply, though with less force, to the rubber-tired vehicle. Several

witnesses suggested that, in this case also, a minimum diameter should be prescribed, and have mentioned sizes varying from 2½ ft. to 3 ft. The Committee, however, is satisfied that the roads would benefit considerably if the use of wheels of small diameter were prohibited, and recommends that a new requirement should be imposed to the effect that the diameter of any wheel which is fitted with a tire of a soft or elastic material, other than a pneumatic tire, should be not less than 2 ft. 6 in., inclusive of the tire. As such a requirement will apply to wheels of vehicles when in actual use, whether the wheels be shod with new or worn tires, it will in practice entail a slightly large diameter when the tire is new, so as to allow for the reduction in the size of the diameter due to the wear of the tire. For the purpose of the requirement, the size of diameter should be ascertained by horizontal measurement.

It is not considered desirable to prescribe a scale of minimum diameters proportionate to axle weight in the case of wheels fitted with solid rubber tires. In this connection the Committee point out that under the Heavy Motor Car Order, rubber-tired motors permitted to carry the heavier axle loads are restricted to a slower speed.

The Twin Tire Absolved

Objection has been taken to the use of the twin solid rubber tire, on the ground that it does more damage to the road than the single tire. The Committee, however, concludes that the only special damage which can be attributed to the twin tire is due to some displacement of road material which is forced into the space between the two tires as they expand towards each other—the "pinching" action of the tires—and that this process can only occur on a road the surface of which is not firm enough to withstand the expansion and contraction of the tire. Assuming that some special damage does occur, it may be doubted whether the matter is very serious, and it must be remembered that the twin tire secures a larger contact area than could reasonably be expected to be obtained by the use of the single tire, given the same axle load.

Complaints have also been made of the hardness of the solid rubber tire, when worn. The evidence as to the damage attributable to this cause is conflicting. Such damage would appear to be due to the increased weight pressure on the road, resulting from the reduction of the contact area. The figures with which the Committee was supplied did not indicate that in the case of a worn tire there is any serious reduction of the contact area. Moreover, it has been suggested that as the tire becomes worn and hardens, the damage to the road, due to the expansion and contraction of the tire, is reduced. As a rubber tire may continue in use until it is worn down almost to the rim of the wheel and causes damage, the Committee think that there might be some general provision or regulation—not necessarily limited to rubber-tired vehicles—prohibiting the use of wheels or tires which are in a state of disrepair, or in such a condition as to cause, or be likely to cause, undue damage to the highway.

After a careful consideration of the objections and complaints with regard to the size or shape of the solid rubber tire, and the quality or character of the material of which it is composed, the Committee came to the conclusion that it would be undesirable to suggest any regulation dealing with these matters. They are in effect controlled by the practical necessities of the case. To absorb vibration, which is one of the main functions of the solid rubber tire, the material must necessarily be capable of deflection; to ensure strength and durability, whether on good roads or bad, the tire must be of adequate size. In sum, the Committee declare themselves disposed to agree with the witness (Mr. Paull) who claimed that the interests of the tire-maker are so closely identified with those of the road-maker that it can safely be left to the former to produce the best possible tire.

Other Recommendations

It is further recommended that the minimum diameter of 2 ft. at present applicable to the iron or steel tired wheels of trailers exceeding one ton in weight unladen be increased to 2 ft. 6 in., but it is not thought necessary to prescribe a minimum diameter for wheels of trailers having rubber tires. Bevelled edges should not be permitted on iron and steel tires.

Heavy motor cars registered and in use before amending regulations come into operation should be exempted from compliance with any new requirements.

The present speed limit regulations should be retained, subject to the following amendments, namely (a) that the speed for a heavy motor car tired with iron, steel, or other hard substance, should not in any case exceed five miles an hour; and (b) that where a heavy motor car draws a trailer and the wheels of both vehicles are fitted with rubber tires, the maximum speed should be eight miles an hour.

The New Revenue Law and the Tire Industry

Manufacturers of pneumatic and solid tires and inner tubes will be interested in the following opinion by Charles Neave, Counsel for The Rubber Association of America, in regard to the various provisions of the new War Revenue Law and their effect on the tire business. This report has been made at the request of the Pneumatic and Solid Tire Manufacturers' Divisions of the Association.

The War Revenue Bill of 1918, which, according to report, is about to be signed by the President, provides, among other things, for the following excise tax:

Sec. 900. That there shall be levied, assessed, collected, and paid upon the following articles, sold or leased by the manufacturer, producer, or importer, a tax equivalent to the following percentages of the price for which so sold or leased:

(1) Automobile trucks and automobile wagons (including tires, inner tubes, parts, and accessories therefor, sold on or in connection therewith or with the sale thereof), 3 per centum;

(2) Other automobiles and motorcycles (including tires, inner tubes, parts and accessories therefor, sold on or in connection therewith or with the sale thereof), except tractors, 5 per centum;

(3) Tires, inner tubes, parts, or accessories, for any of the articles enumerated in subdivision (1), or (2) sold to any person other than a manufacturer or producer of any of the articles enumerated in subdivision (1) or (2), 5 per centum.

In accordance with Sec. 1309 (c), this tax "does not apply in respect to articles sold or leased for export, and in due course so exported"; the Commissioner is to make rules and regulations as to this.

Further in accordance with Sec. 900, if the manufacturer, producer or importer of the articles customarily sells them both at wholesale and retail, the tax in the case of an article sold by him at retail is to be computed on the price for which like articles are sold by him at wholesale.

In my opinion, the seller of the articles may and should invoice them at the regular price (that is, without taking account of the tax) and add as a separate item the amount of the tax.

In accordance with Section 903, monthly returns under oath in duplicate must be made with reference to the taxes, and taxes must be paid to the collector of the district in which the principal business of the seller is located; the Commissioner will undoubtedly prescribe regulations as to this.

The tax is payable to the Collector at the time when each return is filed, and if not paid when due, there shall be added the penalty of 5 per cent, together with interest at the rate of 1 per cent for each full month from the time when the tax became due.

It might be well also to direct the attention of your members to the provisions of the War Revenue Act relating to payments of taxes with reference to sales under contracts made prior to certain dates. The following articles contain these provisions, and when reading them it is to be borne in mind that Section 900, first quoted in this letter, is under title IX referred to in the following sections:

Sec. 1312. (1) That (a) if any person has prior to May 9, 1917, made a bona fide contract with a dealer for the sale or lease, after the tax takes effect, of any article in respect to which a tax is imposed under Title VI, VII, or IX, or under subdivision 13 of Schedule A of Title XI,

or under this subdivision, and (b) if such contract does not permit the adding of the whole of such tax to the amount to be paid under such contract, then the vendee or lessee shall, in lieu of the vendor, or lessor, pay so much of such tax as is not so permitted to be added to the contract price. If a contract of the character above described was made with any person other than a dealer, the tax collected under this Act shall be the tax in force on May 9, 1917.

(2) If (a) any person has prior to September 3, 1918, made a bona fide contract with a dealer for the sale or lease, after the tax takes effect, of any article in respect to which a tax is imposed under Title VI, VII, or IX, or under subdivision 13 of Schedule A of Title XI, or under this subdivision, and in respect to which no corresponding tax was imposed by the Revenue Act of 1917, and (b) such contract does not permit the adding, to the amount to be paid under such contract, of the whole of the tax imposed by this Act, then the vendee or lessee shall, in lieu of the vendor or lessor, pay so much of the tax imposed by this Act, as is not so permitted to be added to the contract price. If a contract of the character above described was made with any person other than a dealer, no tax shall be collected under this Act.

(3) If (a) any person has prior to September 3, 1918, made a bona fide contract with a dealer for the sale or lease, after the tax takes effect, of any article in respect to which a tax is imposed under Title VI, VII, or IX, or under subdivision 13 of Schedule A of Title XI, or under this subdivision, and in respect to which a corresponding tax was imposed by the Revenue Act of 1917, and (b) such contract does not permit the adding to the amount to be paid under such contract of the whole of the difference between such tax and corresponding tax imposed by the Revenue Act of 1917, then the vendee or lessee shall, in lieu of the vendor or lessor, pay so much of such difference as is not so permitted to be added to the contract price. If a contract of the character above described was made with any person other than a dealer, the tax collected under this Act shall be the tax in force on September 3, 1918.

(4) The taxes payable by the vendee or lessee under this section shall be paid to the vendor or lessor at the time the sale or lease is consummated, and collected, returned, and paid to the United States by such vendor or lessor in the same manner as provided in Section 502.

(5) The term "dealer" as used in this section includes a vendee who purchases any article with intent to use it in the manufacture or production of another article intended for sale.

Notes of the Tire Trade

One East Palestine Company Insures Employes—The Other Expands—Firestone Puts Out New Fabric Tire—Auto Dealers Reelect Vesper—New Speed Record for De Palma

McGraw Tire Insures Employes

Employes of the McGraw Tire & Rubber Company, East Palestine, Ohio, have just been insured for a total of over one million dollars, total premiums on which will be paid by the company.

Many features have been incorporated in the policies, which make the insurance more than usual value. For example, the amount of the policy increases automatically with length of service; there is also a disability clause whereby, if the insured becomes permanently disabled, the amount of the policy will be paid in monthly installments; in event of death, the face value of the policy is paid in full to the beneficiary. There is also a conversion clause which enables the holder to continue the insurance after leaving the company's employ.

The life insurance plan is augmented by a "benefit association" operated by the employes themselves. For a nominal monthly payment, employes are protected in case they are out of work due to illness or accident. Membership in the benefit association carries with it the privileges of the McGraw Club, a splendid institution which provides complete facilities for healthful recreation.

Through this elaborate plan of welfare work the company expects to maintain a more contented and permanent force of labor of the best quality which is essential to making tires of highest worth.

Skinner Enters Tire Business

Major C. P. Skinner, well known in New York and Eastern automobile circles from his connection with the New York Mitchel Company, has been released from the service and has opened a tire distributing business. The new venture is called the Horseshoe Tire Company, it is incorporated for $100,000 and is located at 144 West 65th Street, New York City. It will distribute the products of the Racine Auto Tire Company, Racine, Wis. With Mr. Skinner is Col. F. K. Espenhain.

National Tire Expanding

The construction of a large addition to the factory of The National Tire & Rubber Company, East Palestine, Ohio, is going ahead rapidly and the company is planning to enter the approaching busy season with a greatly increased production to take care of the growing demand for its products. To better care for this growing demand it is bringing out two new brands of high grade guaranteed tires for distribution exclusively through jobbers.

The National Tire & Rubber Company has just presented each of its employes with a life insurance policy, the cost of which is paid entirely by the company. At the time of death of an employe the full amount of the policy will be paid to his beneficiary, and also there is a special disability clause whereby in case of permanent disability the amount of the policy will be paid in monthly installments. The policy carries a conversion clause which enables the holder of the policy to continue the insurance after leaving the employ of the company. The amount of the policy increases automatically as the employe's time of service increases.

The National Tire & Rubber Company has no connection with the National Rubber Company, Pottstown, Pa.

Vesper Again Heads Dealers

F. W. A. Vesper, of St. Louis, Mo., was re-elected president of the National Automobile Dealers' Association at the close of this body's two-day annual convention on Jan. 29 in Chicago, Ill. One of the resolutions passed pledged the organization to complete co-operation with automobile manufacturers in the solution of reconstruction problems.

Plans were formulated for campaigns in all sections through local and state associations for the promotion of good roads. The association will take up national road aid.

The report of the secretary gave the membership as 4475.

A New Firestone Tire

The Firestone Tire & Rubber Company, Akron, Ohio, has placed a new construction fabric tire on the market. It incorporates, in the main, the principles that have made the Firestone cord tire a general success, and as a consequence it possesses a number of good points often thought of as belonging almost exclusively to the cord type.

Perhaps the notable feature is the presence of a generous reinforcement that extends around the bead and part way up the side on both inside and outside. Being in the form of a heavy extra layer of fabric, this addition stiffens the casing at exactly the point where the strain comes, and raises the bending point to where the diameter is amply large. The tire is thus kept from pressing against the rim and sustaining rim cuts, besides deriving more absolute strength in point of actual thickness. Since the curve in the side wall of the tire when it is under a load is by this means rendered more gradual, the danger of crimping is minimized, less heat is generated, and the tendency to become brittle and then to crack is reduced in a corresponding degree. Plainly, too, the likelihood of blow-outs is proportionately diminished.

In all other respects this new construction fabric tire has been most carefully planned. A very tough yet resilient tread is used with a body likewise calculated in every detail to promote riding comfort. Immediately beneath the tread is set a powerful breaker strip, whose function it is to distribute all vibrations around the entire circumference of the casing and thereby to lessen the acuteness of shock in any one spot. Next a very thick and "springy" cushion is made of pure Para gum and placed just below the breaker strip for the purpose of absorbing any jar that penetrates both tread and breaker strip. These parts are vulcanized solidly with one another and impregnated with an unusually large amount of rubber. In all, this new fabric tire is said to represent about as near an approach to the advantages of cord constructions as it is possible to obtain.

De Palma Makes New Records

In the recent victories of Ralph De Palma can be seen more than the mere breaking of speed records. When the speed demon broke all records up to twenty miles he proved worth of American workmanship—both in the construction of automobiles and tires.

Despite the grind which the tires were forced to endure, they hardly showed that they had been used. Few persons really appreciate what a tire must withstand at a speed of 150 miles per hour. To cover a mile in less than half a minute the tires were revolving at the rate of 1500 times a minute, or 25 times every second, and the tire to endure this speed shows that the proper engineering skill has been used in its manufacture. The tires used by De Palma were of cord construction and were the product of the Goodyear Tire & Rubber Company, Akron, Ohio.

Killacky with Fred Stern

H. J. Killacky, formerly with the Rubber Association of America, and more recently of the United States Navy, has become asistant to Paul Elbogen, manager of the Akron, Ohio, branch of Fred Stern Company, New York City, crude rubber merchants. This branch is located in the People's Savings and Trust Building.

Tires in all Sizes to be Manufactured

To Assure Renewals Joint Conference of Representatives of Tire and Automobile Industries Decide to Drop Curtailment Program—Held Unnecessary Now That War Is Over

Every tire size for which there is a demand in the trade will be available so long as that demand continues. This is the effect of a decision reached late last week at a conference between representatives of the tire industry and the National Automobile Chamber of Commerce in New York City. Thereby is entirely dropped, so far as the trade is concerned, any gradual curtailment of sizes along lines indicated when, last summer, the tire makers drew up a set of nine standard sizes toward which they undertook to work in the interests of economy dictated by war conditions. The first action was taken at the instance of the Commercial Economy Board, later the Conservation Division of the War Industries Board.

"The standardization program was not so much economy as it was curtailment," declared one man prominently identified with the automobile industry. Its need grew out of threatened continuance of the war for another year or two, and in such an event it would have proved of benefit, though not without embarassment to owners who found themselves with cars using the proscribed rim sizes. So much was this embarrassment appreciated at the time even that on the authority of an executive high in the tire industry it was pointed out that later adjustments of the curtailment schedule might be made through action with the Government. The present step is an echo of that forecast, though with the need of curtailment past and consultation with the Government no longer necessary the tire makers have been able now to promise that every size will be furnished for which there is demand among the trade so long as that demand continues.

G. M. Stadelman of the Goodyear Tire & Rubber Company, chairman of the Pneumatic Manufacturers' Division of the Rubber Association of America, and H. H. Rice, chairman of the committee representing the National Automobile Chamber of Commerce, were in charge of the conference. Others attending represented the United States Tire Company, the B. F. Goodrich Company, Firestone Tire & Rubber Company and the Fisk Rubber Company. Car makers were present in the persons of representatives of Dodge Brothers, Studebaker, Maxwell, Chalmers, Hupp, Olds, Liberty, Lexington, Oakland and Scripps-Booth.

Tire Trade Notes

Kelly-Springfield Profits Increase Seventy Per Cent—Ajax Has Larger Turnover But Smaller Profits—Goodrich Reopens Maine Branch —McGraw Has New York Branch

Kelly-Springfield Hits New Record

For the Kelly-Springfield Tire Company, New York City, another record year closed with December 31 last. On sales which showed a gross profit nearly 70 per cent larger than that for the previous year, net profits were made more than 70 per cent larger. Without allowance for federal taxes surplus for the year was more than double that of 1917. These facts are revealed in the annual statement just made public, which shows that gross profit on sales for the recent year were $7,187,834. Net profits on this amount were $4,589,765. Deducting $224,538 for the company's profit-sharing plan and interest charges, $434,124 for federal taxes arising out of the year 1917, balance available for dividend and sinking fund purposes was $3,931,103. Surplus for the year was $2,939,902, which, added to the earlier amount carried in this account reached a total of $9,631,020. Drawing out $433,162 for a special surplus account for the retirement of preferred stock, general surplus remaining was $9,197,858.

This was accomplished in spite of largely increased difficulties attendant on getting raw materials, reduced amounts of material at hand, and restricted labor and transportation conditions. This fact is stressed in the report of President Van H. Cartmell, who adds that the outlook for 1919 is excellent.

No intimation was given in the report of what might be chargeable against the year's income for war income and excess profits taxes. The taxes paid for 1917, which were deducted from the 1917 net income in the statement of general surplus, aggregated $434,124, and will no doubt be much higher for 1918.

The balance sheet of December 31, 1918, shows that the company progressed unusually well during 1918. While in that period the current assets were raised from $6,500,000 to $9,500,000, current liabilities were reduced $200,000, so that the working capital at the end of 1918 was $8,382,681, an increase of approximately $3,000,000 from that at the end of 1917.

The increase in current assets is represented largely by an advance of more than $500,000 in cash in banks and on hand, an increase of more than $2,000,000 in inventories. In the current liabilities there was a drop of $100,000 in notes payable and a smaller decline in accounts payable.

	1918.	1917.
Assets		
Cash in banks and on hand	$1,392,729	$772,448
Accts. and notes rec.	1,467,296	1,748,346
Inventories	5,945,417	3,760,161
Cgs. deferred for future oper.	37,883	32,188
Liberty Loan bonds.	596,793	272,353
Common stock purchased for resale to employees less employees' sub. payments and loan being liquidated by employees' payments	42,197	8,560
Plant accts., patent rights, etc.	9,665,677	8,781,775
Total	$19,147,995	$15,395,835
Liabilities		
Preferred stock	$3,407,100	$3,409,300
Common stock	4,907,200	4,907,200
Notes payable	500,000	600,000
Accounts payable	221,815	235,752
Accrued taxes (other than Federal), accrued wages and other accruals	158,486	78,960
Res. for extra compensation on profit sharing basis	88,148	.....
Preferred dividend	51,106	52,639
Loan payable—Lib. Loan bonds	.....	231,185
Sinking fund for redemption of preferred stock	.....	75,164
Special surplus account	433,162	.....
Res. for redemption of inventories	183,118	.....
General surplus	9,197,858	5,705,633
Total	$19,147,995	$15,395,835

Ajax Profits Less

The Ajax Rubber Company, New York City, showed an increase in its income for the year of $960,075 over last year, but a decrease of $266,225 in its profits after the necessary deductions for taxes, dividends, etc., were made. The balance sheet for the year ended December 31, 1918, as compared with that ending December 31, 1917, follows:

	1918.	1917.
Income Account		
Profits	$2,915,368	$1,955,293
Provision for Federal war profits and income taxes	1,700,000	495,000
Net income	$1,215,368	$1,460,293
Dividends	852,000	830,700
Surplus	$363,368	$629,593
Previous surplus	768,840	139,247
Total surplus	$1,132,208	$768,840
Assets		
Land, buildings, machinery, etc., less depreciation	$2,142,536	$1,862,605
Other property	17,410	.....
Patents, good will, etc.	1,874,875	1,874,875
Inventories	3,917,368	5,424,827
Accounts receivable	2,165,420	2,334,585
Liberty bonds	477,838	148,000
Cash in banks and on hand	363,613	257,341
Deferred charges	112,571	118,213
Total	$11,071,634	$11,920,449
Liabilities		
Capital stock	$7,100,000	$7,100,000
Accounts payable	832,801	3,401 493
Taxes payable (Wisconsin)	75,734	.....
Bonuses payable	230,889	155,114
War profits and income taxes (estimated)	1,700,000	495,000
Surplus	1,132,208	768,840
Total	$11,071,634	$11,920,449

At the directors' meeting, F. E. Dayton, formerly secretary, was elected vice-president. W. J. Jackson succeeds Mr. Dayton as secretary.

Goodrich Reopening Maine Branch

The B. F. Goodrich Rubber Company, New York City, is to reopen its branch in Bangor, Maine. R. J. Devereaux will return as manager. The company is reconstructing its sales and stock depot at 37 Franklin Street, that city, to accommodate 500 to 600 additional tires and tubes.

McGraw Doing New York Business District

The McGraw Tire & Rubber Company, East Palestine, Ohio, has been authorized to do business in the State of New York, and the McGraw Tire & Rubber Company of New York has, consequently, been dissolved. G. A. Schumacher is now in charge of the McGraw's New York offices at 55 Thirty-third Street, Brooklyn, N. Y.

C. F. Troupe Succeeds Lee

C. F. Troupe, who represented the Fisk Rubber Company, Chicopee Falls, Mass., in the East and South, has succeeded Frank M. Lee as sales manager of that company in Wisconsin and upper Michigan. Mr. Lee retired after a term of twenty-five years of continuous service.

Rubber Dividends Declared

The Goodyear Tire and Rubber Company, Akron, Ohio, has declared a quarterly dividend of 2 per cent on preferred stock.

The Hood Rubber Company, Watertown, Mass., has declared a 45th consecutive 1 3-4 per cent dividend on its preferred stock.

Happenings of Interest to Tire Men

Fisk Shows Increased Earnings and Reduces Common Par Value—Sioux City to Enlarge—Lincoln Highway Association Reelects F. A. Seiberling—Perfection to Make Keystone Tires for West

Fisk Rubber's Earnings

Even a year of war with its attendant uncertain industrial conditions and partial curtailment could not keep the Fisk Rubber Co. from showing a steady improvement in its annual statement, though the improvement could be expected to be larger without that all pervading disturbance. Net sales of the company for 1918 reached $36,682,163.78, out of which were secured net profits amounting to $3,760,279.84. From surplus balance at the beginning of the year federal taxes $549,913.63 were drawn for 1917. Dividends were paid out to the total of $946,750 and from the surplus $589,659.22 was set aside for retiring first preferred and first preferred convertible stock in 1919. Further liberal provision is made for federal taxes arising from the year 1918 to the extent of $1,253,426.61, leaving a surplus balance as of December 31 last amounting to $4,425,923.35.

At the annual stockholders' meeting held Wednesday of this week all of last year's directors were re-elected as follows: J. D. Anderson, E. H. Broadwell, H. T. Dunn, H. G. Fisk, G. A. Ludington, F. T. Ley and Stedman Butterick of Boston. These re-elected the following officers for another term: H. T. Dunn, president; E. H. Broadwell, vice-president; J. D. Anderson, vice-president; G. A. Ludington, vice-president; H. G. Fisk, treasurer and clerk.

It was also voted to reduce the par value of common stock from $100 to $25. Holders of common stock will receive four shares for one.

Fisk Reduces Common Par Value

At the annual meeting of the Fisk Rubber Company, Chicopee Falls, Mass., held in that city February 19, stockholders voted to change the par value of the common stock from $100 to $25 a share. They also authorized the reduction of the capital stock by $770,100 through the retirement of 7,701 shares of first preferred stock now held in the treasury. This stock was purchased by the company. All officers and directors were re-elected.

According to the company's financial statement for the year ended Dec. 31 last, net sales for 1918 amounted to $36,682,163. The total surplus for the year was $4,425,923, approximately $400,000 more than 1917. After deducting costs, interest on borrowed money, etc., a net surplus of $3,760,279 remained.

L. H. A. Reelects F. A. Seiberling

At the recent annual election of officers of the Lincoln Highway Association, F. A. Seiberling, president of the Goodyear Tire & Rubber Company, Akron, Ohio, was unanimously re-elected president of the organization for the current year. During 1918, under Mr. Seiberling's presidency, the Lincoln Highway put into effect a comprehensive program of highway improvement in many sections. The most elaborate part of this program was the construction of an 18 mile stretch of gravel road across the Great Salt Lake Desert, in Utah, cutting off 50 miles from the former route between Salt Lake City and Ely, Nevada. This section is known as the "Goodyear" section. Its construction was financed both by Mr. Seiberling, personally, and by the Goodyear Tire & Rubber Company.

McGraw HiTread Truck Tire

The McGraw Tire & Rubber Company, East Palestine, Ohio, have added an over-size truck tire to their established line of tire products, which is being marketed under the trade name "McGraw HiTread."

This tire is said to contain from 15 to 30 per cent more tread rubber than the so-called standard profile truck tires, and while primarily designed for heavy truck service, it is creating unusual interest among owners of light weight trucks, because of its resilient qualities.

Another feature of this tire, which is said to be substantiated by factory tests made in the experimental department of the McGraw Tire & Rubber Company is that it does not separate from its base. As high as one hundred tons hydraulic pressure have been exerted against the side walls approximately one inch outward from the channel lip, which pressure fails to start loosening the tread from its base.

In order to properly handle the constantly increasing truck tire business of the company, several additions have been made to the personnel of the company's truck tire department. J. S. Wiese, formerly with the United States Tire Company, New York City, has been appointed manager truck tire department, with headquarters at East Palestine, Ohio. Howard G. Couturier, formerly of the Kelly-Springfield Tire Company, New York City, is now also affiliated with the McGraw Tire & Rubber Company as district manager, with headquarters at Chicago, Ill. Mr. Couturier will have charge of both pneumatic and truck tire sales, being assisted by Mr. George Ekhardt, formerly of the Kelly-Springfield Tire Company's Chicago branch.

Asks Tire Firm Receiver

Daniel W. Blumenthal, 35 Nassau street, New York, has filed against the National Rubber Company, Pottstown, Pa., a bill in equity asking the appointment of a temporary receiver to conserve the assets of the concern. Blumenthal is secretary and treasurer of a stockholders' committee. The contentions will be aired in the United States District Court on February 27. Blumenthal contends that the company as presently managed has issued stocks making the assets of the concern, including the Pottstown plants, the basis for the issuance of the securities. He claims also that the company should not have paid an eight per cent dividend recently declared. He seeks to sever from any connection with the company "those who have been a party to the waste, mismanagement and extravagance alleged."

Perfection Gets Keystone Contract

The Keystone Tire & Rubber Company, New York City, has entered into a contract with the Perfection Tire & Rubber Company, Fort Madison, Iowa, by which the latter will manufacture Keystone tires and supply them direct to the stores controlled by the Keystone company in the Middle West. The contract is on the cost-plus basis, similar to the one the Keystone company has with the Gryphon Tire & Rubber Corporation, New York City.

New Goodyear Booklet

"Profitable Farm Hauling with Motor Trucks," is the business-like title of the latest addition to motor trade literature, just issued by the Goodyear Tire & Rubber Company, Akron, Ohio.

In this booklet is interestingly portrayed the practicability of the motor truck as a farm tool, when aided by pneumatic cord tire equipment. The adaptability of many American inventions to farm usage is nowhere better illustrated than in the application of the motor truck to the solution of the many transportation problems incidental to farming.

Just as the advantages of electric lights, gasoline engines, water systems and numerous other appliances and conveniences have been made possible in rural communities, so the motor truck has "arrived" to contribute its share to the simplification of hauling on the farm.

The new booklet is primarily one discussing the many ways in which motor trucks may fit into farming activities, and is intended to illustrate the progress Goodyear has made in the big pneumatic cord truck tire field within the last several years.

From the foreword: "The ability to carry heavy loads across rolling fields, regardless of roads and seasons; to quickly transport farm products to market over sandy or muddy or snowy roads; to move live stock to shipping points with a saving of shrinkage in weight; to carry garden produce, fruits and other crushable materials to destination quickly; to save time and labor in bringing closer to the farms—all of this is what makes a motor truck a practical and profitable farm tool."

Motor trucks have been used in farm work for a long time. But, being mostly equipped with solid rubber tires, they could not give full service. They could only travel over good, dry roads or hard ground and were limited to slow speeds on account of jolting. But farmers today cannot be contented with half measures.

The booklet cites numerous examples of farm motor truck transport covering a wide diversity of service in representative sections of the country and abounds in photographs of pneumatic-tired trucks that have proved their worth as individual units of farm equipment, with the story of each truck's performance reviewed.

Interesting figures are shown outlining comparisons of wagon costs with motor truck costs—with the motor truck in the ascendency—as compiled by the U. S. Department of Agriculture. Copies of the new Goodyear booklet are available and free for the asking.

Sioux City Tire to Expand

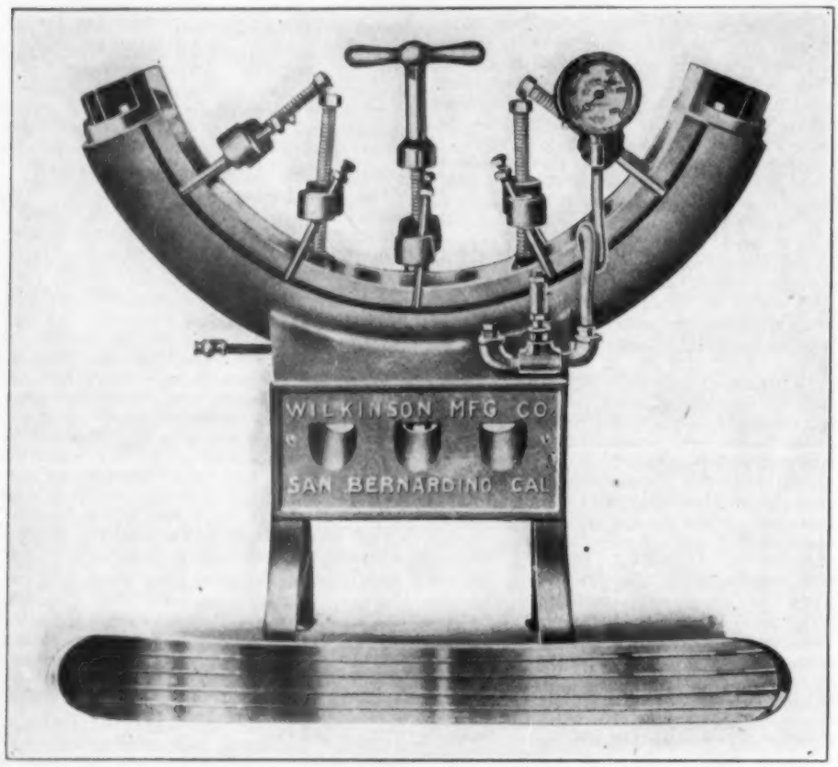
At the annual meeting of the Sioux City Tire and Manufacturing Company, Sioux City, Ia., it was decided to enter into an expansion program involving investments of some $200,000 in additional factory and machine equipment. The improvements will cover an entire block owned by the company in the Iowa city. At the meeting 150 stockholders were present and a dividend of 8 per cent was declared on the preferred stock and 30 per cent on the common. The tire output for this year, estimated at $1,000,000 in value, has been disposed of by contract. Directors were elected as follows: Charles F. Sawyer, R. G. Hicks, Curry Hunter, Sioux City; O. Walker, River Sioux, Ia.; John Roghair, Orange City, Ia.; C. H. Meyer, Denison, Ia., and H. C. Brown, Hinton, Ia.

Miscellaneous Items of Interest

A New Retreading Equipment—Lowell Edits Miller Talk—Springfield Honors Maus—Dunlop Shows Gain in Profits—Lee Has Good Year—New Keystone Officers

New Wilkinson Repair Equipment

The Wilkinson Vulcanizer Manufacturing Company, San Bernardino, Cal., has brought out a new one-third circle retread vulcanizer of the dry cure process type, which it claims to be superior to the Kettle open-cure methods in that only the part of the tire undergoing repairs and protected with fresh rubber is subjected to heat. The one-third circle vulcanizer is equipped with special new cooling ends, which semi-cure the parts of the tire where the laps between the old and the new stock occur, and are said to prevent spongy places and lap marks on the repaired tire.



WILKINSON MODEL "K" STEAM RETREADER

These cooling ends are made of cast iron, aluminum, brass, bronze, or other suitable material and have flanges, which increase heat radiation for cooling. Between the ends and the walls of the steam chamber of the vulcanizer a heavy packing of asbestos or other non-conducting material is arranged to prevent the conduction of heat from the vulcanizer to the cooling ends, which are detachable and held in place by cap screws.

Each circle vulcanizer is equipped with its own burners, steam gauge and safety valve. When it is desired to use a boiler as a source of steam, the necessary connections are substituted for the burners, gauge and valve.

This retread vulcanizer is made in two sizes and is complete for all smooth tread work. Type H takes 3, 3½ and 4-inch tires; its list price is $82.50. Type K is for larger sizes, including 4½, 5 and 5½-inch tires; it lists at $110.

For non-skid or ribbed tire retread work aluminum matrix sleeves are supplied for placing inside the curing cavity. These sleeves are machine finished and highly polished to produce a perfectly smooth retread. Five pressure clamps are provided. The matrices are listed at $33 and $44 for Type H and Type K, respectively.

Lowell to Edit Miller Organ

H. Parker Lowell has resigned as advertising manager of the M. O'Neil Company, Akron, Ohio, to become editor of *Miller Talk*, the Miller Rubber Company, Akron, house organ. The publication suspended during the war.

Lowell came to Akron in 1917 as a member of the copy staff at The B. F. Goodrich Company. He had previously been engaged in newspaper work in Des Moines and Waterloo, Iowa, and Chicago. He graduated from Northwestern University in 1910 and is a member of Adoniram Lodge No. 517, F. & A. M.

Archer Cord's Annual Meeting

The stockholders of the Archer Cord Tire & Rubber Company, Minneapolis, Minn., have elected the following directors: M. A. Hessian, V. Chamberlain, W. A. Bieter, W. B. Cory, T. Wilder and F. Graham, who met in turn and elected officers as follows: W. F. Bigelow, president, W. A. Bieter, vice-president, and M. A. Hessian, secretary and treasurer.

J. B. Maus Honored

John B. Maus, export manager of the Fisk Rubber Company, Chicopee Falls, Mass., has been appointed chairman of the Foreign Trade Division of the Springfield Associated Interests, an association working for the better interests of foreign trade.

Dunlop Has Good Year

A large increase in profits is reported by the Dunlap Rubber Company, Limited, Aston Cross, Birmingham, England, which held its annual meeting on February 11. A gain of $1,057,000 over 1917 profits was made by the company last year, the profit being $3,250,000, compared with $2,175,000 in 1917. The profits for 1918 were stated to be the largest in the history of the company. The company did not include in this statement of profits a sum of approximately $1,625,000 which has been retained for development and as additional working capital in the rubber estates and subsidiary companies and for the special plant and buildings depreciations. Thus, the actual earnings for the year are brought up to $4,875,000.

The solid tire business showed a large increase, amounting to nearly 60 per cent. The company is now planning new additions to increase its production. The new works at Fort Dunlop are in the process of enlargement. Approximately $2,000,000 will be expended by next August on these additions and it is expected that the pneumatic tire production will as a result be increased doubly and the solid tire production about 50 per cent.

The retiring directors and auditors were re-elected and Sir Arthur de Cros, chairman and managing director, was elected for life as president. Alfred de Cros has been nominated as vice-president. Harvey du Cros, the founder and president of the company, died during the war.

Lee Earnings Show Substantial Increase

The Lee Rubber & Tire Corporation, New York City and Conshohocken, Pa., showed earnings of $250,000 for 1918, as compared with $220,000 for 1917, after all necessary deductions were made. Sales for January, 1919, were about 30 per cent larger than for the corresponding month of last year. Although the company's financial condition is understood to be good, there is no prospect of a disbursement to the stockholders for some time.

Westlake Joins McGraw Sales

W. A. Westlake, one of the original organizers of the Motor Truck Club, has been made eastern sales manager for the Motor Truck Tire Department of the McGraw Tire & Rubber Company, New York. Westlake has been in tire sales for twelve years and will add a long training and a wide acquaintance to the McGraw organization.

New Keystone Officers

Sydney Bernheim and Walter Lowenthal have been elected vice-president and secretary, respectively, of the Keystone Tire & Rubber Company, New York City. Both are lawyers, were previously identified with the company and will now have offices in the Keystone Building, Broadway at 62nd street, after March 1st.

New Tire Company in Ohio

Point Clinton, Ohio, has been chosen as the home of the Ohio State Tire Company, organized with a capital of $300,000. A steel plant has been purchased and the new concern expects to be in production by June 1st.

Hardman Buys Endurance

The Hardman Rubber Corporation, Belleville, N. J., has purchased the plant of the Endurance Tire & Rubber Company in New Brunswick, N. J., to which it is removing. Inner tubes and cord tires will be manufactured.

MARKETS

Manufactured Rubber Goods

NEW YORK, March 7, 1919.

Since our last report there has been a moderate improvement in general business, though trade cannot yet be described as active. Caution is still the word of order, but on the whole feelings are more cheerful, for the general condition of business is better than it was a fortnight ago.

In the Northwest, where the buying power of the farmer is unusually high, both wholesale and retail trade is considered to be in a promising condition. Good business is also expected in the Southwest, while in the East also the tone of business is more encouraging and better things are expected.

Though unemployment is increasing, it is hoped that as spring advances the demand for labor will readily absorb the supply. At any rate conditions are expected to improve later on.

Mechanicals

There is little change to report in the basic conditions governing the market for mechanical rubber goods. Both wholesale and retail buyers generally are placing orders in the main for actual needs and quite universally without anticipating their wants any distance ahead. The feeling is that, while prices may not be reduced as soon as was expected some time back, it is advisable to exercise caution and reach a lower level gradually.

Business in the wholesale end of the trade is particularly slow in the East, where stocks are believed to be more generous than in other parts of the country. Retailers, however, are doing a fair volume of business, most of them reporting sales above normal for this season of the year, and good spring business expected.

Sales in garden hose are reported, but the market is unusually quiet, though very healthy in condition in the jobbing end especially. Prices hold firm.

The following are quotations from jobbers' lots:

Garden cotton hose, Merit, ⅝-inch	$0.13
Rubber hose, Leader, ½-inch	0.11½
Rubber hose, Good Luck, ⅝-inch	0.14½
Rubber hose, Milo, ⅝-inch	0.15
Rubber hose, Bulldog (seven ply), ⅝-inch	0.18½
Rubber hose, Olympia (wire bound), ⅝-in.	0.13¾

One cent per foot should be added in ordering in 25-foot lengths.

The belting trade is very quiet, which is particularly noticeable after the period of big demand that was created by the expansion of business for war purposes. At the same time prices are very firm, and merchants are quite hopeful that a big demand will start as soon as industry in general is readjusted to peace conditions. In fact, many believe that there will be increases in belting values before many months.

Tires

The open weather has continued to stimulate the retail demand for tires, which has been unusually large for this season of the year. Dealers, however, have not generally been disposed to stock up heavily on tires, though none of them seem to expect lower prices soon and some manufacturers have been guaranteeing prices up to July 1.

When it was known that the new War Revenue Law would go into effect immediately and that dealers' stocks and tires ordered and billed prior to February 25 would be exempt from taxation there was a tremendous rush of orders from dealers who wanted to cover their requirements before that date. Tire companies were literally submerged with these orders, which came in faster than they could be entered, and many a dealer will regret not having acted sooner.

Tire manufacturers have prepared schedules including the new five per cent tax based on the net selling price to the dealer, who in turn will add to his selling prices to consumers. On adjustments, the tax will be payable on the adjustment price.

DRUGGISTS' SUNDRIES

There have been some small reductions in rubber sundries prices, but these are not general, though business is not spoken of as coming as fast as was expected. The universal report is that while orders are numerous for practically all seasonable lines, they are small, indicating that as far as possible business is now being conducted on a hand to mouth basis.

Cotton Yarn and Fabrics

NEW YORK, March 7, 1919.

Conflicting factors are keeping the cotton market in an extremely uncertain condition, and prices today stand about the same as a fortnight ago. Reports that President Wilson had told Southern Senators that nothing could be done toward lifting the embargo against Germany and Austria until the final peace treaty had been consummated have acted as a bearish factor on the market, and the unsettled condition of labor in the Eastern markets has also had a discouraging effect upon the market. The situation against higher prices created by these factors has been intensified at times by breaks in the Liverpool market, and at these times selling has become more or less general. Lately, the New York harbor strike has depressed values still further. There has been some foreign buying on the breaks, but the trade is generally staying out of the market, awaiting further developments.

A radical departure in trading rules will be forced by the cotton amendment to the wheat guarantee law upon trading, and the local cotton exchange was closed for a day to permit the trade to assimilate the new ruling, which will be put into effect as a move to help the growers. Charles J. Brand, chief of the Bureau of Markets, who will have charge of the enforcement of the new law, has notified exchanges that hereafter all future contracts must be new style. The amendment, which is expected to result in a resumption of trading on the exchanges by mill and spot interests, and to remove the gambling element of the market, removes seven of the twenty-one tenderable grades of cotton under old contracts from the deliverable grades, and provides that the remaining tenderable grades must be passed by Government inspectors instead of exchange inspectors.

Chief Brand's telegram to the New York and New Orleans Cotton Exchanges relative to the new law said, in part, as follows: "All spot cotton delivered on new style contracts will be classed by the Government. Spot cotton delivered on old style contracts will be classed by exchanges as hertofore with right of appeal to Government until such old style contracts are liquidated. Therefore, beginning this morning (March 5) all orders for execution on exchanges should specify 'new style contracts.' Furthermore, similar action will be necessary with reference to orders previously transmitted, but not yet executed. Bona fide liquidation of outstanding contracts will be permitted so long as no new trade in old style contracts is originated. Consider it highly important that future exchanges be kept open for trading and will appreciate your taking promptly all necessary steps to put the act as amended into immediate effect."

SEA ISLAND COTTON

Reports received from Southern markets indicate no change in the situation in Sea Island cotton. There is some business of a hand-to-mouth nature going on, but many of the larger growers continue to hold their cotton for higher prices, refusing to accept the offers of prospective buyers which, they contend, are below the cost of actual production. The market is in a nominal condition with no fixed price governing sales, circumstances surrounding each individual transaction making the price at which the deal is put through.

EGYPTIAN COTTON

Some scattered sales of this cotton have been reported since our last reports, and indications are that the market will soon get into its swing again. There are some consignments of the Egyptian staple reported en route to the American market, one steamer bringing between 5,000 and 8,000 bales being due here in about six weeks from now. This steamer is coming via Liverpool, and the exact date of arrival is not yet known. The trade believes, however, that the market will soon

get into its pre-war swing, and that conditions will work themselves back to normal.

FABRICS

Conditions in the various fabrics markets are still considerably unsettled, and prices are more or less nominal throughout the market. In view of this condition buyers are not entering the market with any degree of confidence, and buying is spasmodic, orders being placed here and there in cases where buyers believe that rock bottom has been reached in the price on some particular fabric, or in cases where they are offered concessions attractive enough to warrant the placing of orders.

TIRE FABRICS

The market has eased off some, and there is a fair inquiry reported for some of the grades, although business has not yet attained a large volume. The 17¼ ounce Sea Island combed fabric is lower at $1.35 to $1.55 per square yard, and the Egyptian combed is quoted at a range of from $1.20 to $1.30 per square yard. There is little inquiry for the Egyptian carded, and the market is quoted nominal. Carded peelers are lower at 85 to 90 cents per square yard, and combed peelers are also down to $1.05 and $1.15.

HOSE AND BELTING FABRICS

Trading is still quiet, although supplies for the trade are now easier to get. The Government continues as a factor in the market, but in lessening degree, buying only enough for equipment for the steadily diminishing army. Consumers appear to be still well stocked on many of the items in the list and are showing no desire to make additional purchases until their business shall have picked up sufficiently to warrant such action.

DRILLS, SHEETINGS AND OSNABURGS

Sheeting prices have been materially lowered since our last report, and although the demand has picked up a trifle, business is still pretty slow, due to the ever-shifting table of market valuations. Prices given below are those prevailing in the market at the time of writing, but goods can be picked up at considerably below these prices if large quantities are concerned. Drills are also materially lower, and the market is in a weak condition with trading very quiet. There is little business of any consequence being booked and buyers are not yet confident that prices have reached their lowest levels, and so are wary of placing any but small hand-to-mouth orders with the trading. Business in osnaburgs is reported as dull.

BURLAPS

The burlap market remains in an absolutely stagnant condition and there is no business of any amount being transacted in the local or other Eastern market centers. The linoleum industry is reported to be placing orders in a small way, but thus far no large orders have been booked from this or other sources. Bag manufacturers, the principal consumers of burlaps, are manifesting absolutely no interest in the general situation and are apparently indifferent as to whether the goods are worth 5 cents or $5 per yard. Prices have slumped considerably since our last report, the drop on 7-ounce material amounting to 20 points, this weight now selling at 6.90 cents per yard. The 7½-inch 40-ounce fabric is about 40 points lower, and declines running all the way from 20 to 220 points have been made in the prices on other sizes and weights of burlaps.

SHEETINGS				
40-inch	2.35-yard	yd.	.17	@.....
40-inch	2.50-yard		.17	@ .17½
TIRE FABRICS				
17¼-ounce Sea Island, combed,		sq. yd.	1.35@1.55	
17¼-ounce Egyptian, combed			1.20@1.30	
17¼-ounce Egyptian, carded			Nominal	
17¼-ounce Peelers, carded			.85@ .90	
17¼-ounce Peelers, combed			1.05@1.15	
DUCKS				
Single Filling (pound basis)		lb.	Nominal	
Double Filling (pound basis)			Nominal	
DRILLS				
37-inch	2.35-yard	yd.	.17½ @.....	
37-inch	2.75-yard		.15¾ @.....	
37-inch	3.00-yard		.15 @ .15¼	
37-inch	3.25-yard		.14½ @.....	
37-inch	3.50-yard		.13¼ @.....	
37-inch	3.95-yard		.12 @.....	
37-inch	2.00-yard Southern		@.....	
37-inch	2.00-yard Northern		@.....	
40-inch	2.40-yard Southern		@.....	
40-inch	2.40-yard Northern		@.....	
52-inch	1.90-yard Southern		@.....	
52-inch	1.90-yard Northern		@.....	
40-inch	2.85-yard		.15 @.....	
40-inch	3.00-yard		.14½ @.....	
40-inch	3.25-yard		.14 @.....	
40-inch	3.75-yard		.17½ @.....	
40-inch	3.60-yard		.14 @.....	
40-inch	4.25-yard		.11 @.....	

Note.—In view of the unsettled conditions prevailing in the market at the present time, the prices quoted above are more or less nominal, and are not guaranteed.

BURLAPS

(Carload lots)

			Per Yard.
7-ounce	40-inch		6.90@.....
7½-ounce	40-inch		6.75@ 6.90
7½-ounce	45-inch*		7.50@.....
8 -ounce	36-inch		6.90@ 7.00
8 -ounce	40-inch		....@ 7.10
9 -ounce	45-inch*		8.00@.....
10 -ounce	36-inch		9.50@.....
10 -ounce	40-inch		9.50@ 9.65
10 -ounce	45-inch		10.00@.....
10½-ounce	40-inch		9.75@10.00

* Nominal.

Chemicals and Compounding Materials

NEW YORK, March 7.

Trading in the general market for chemicals and compounding materials has been generally quiet during the past few weeks, and business has for the most part been confined to small lots, much of this business having been transacted with second hands. Producers report that there is a general feeling on the part of consumers that prices are too high, but point out that they are not yet in a position to quote lower prices, so long as the costs of labor and materials continue as high as at present. Many of these producers are well stocked up on raw materials purchased in the higher market prevailing during the war, and must use these high-priced goods before entering the market and buying more supplies. Some of these stocks are said to be large enough to cover consuming requirements for the next half year.

The export business has taken a sudden slump since the last report, largely as a result of inability to secure sufficient cargo space. South American buyers are making some tentative inquiries in the market and have made some purchases, but the European demand has died away. Manufacturers are disappointed at the falling off in their exports, as they had set about to build up this business to keep them going while the domestic market was going through a transitory state. Prices have been little changed since the last report, individual quotations moving up or down slightly in response to conditions in the market. No radical changes have occurred, however.

SOLVENT NAPHTHA

There has been a fair routine business transacted in this commodity since our last report, some little export business being reported. In this connection France is mentioned as a large buyer, and shipments have also gone to other countries. Domestic consumers have as yet shown little inclination to purchase on a large scale, and are portioning out their purchases, buying only to cover current consuming requirements. Prices continue unchanged on the basis of 22 and 23 cents per gallon.

BENZOL

A fair demand for benzol is reported, but business is largely of a routine nature and is conducted along well established lines. The market, on the whole, has held fairly steady at 22 to 27 cents per gallon, although holders are asking 28 to 30 cents per gallon on the spot. There is some export business reported being put through.

WHITING

The market has been in a rather quiet condition during the past two weeks, and the export demand has slumped off, leaving trading of a quiet nature. Stocks are not overly-large but holders are offering freely. Prices continue unchanged with commercial, being quoted at $1.25 per cwt. in carloads. Paris white, American, is firm at $1.50 to $1.75 per cwt., and English cliffstone continues unchanged at 75 cents to $2.27.

CHINA CLAY

Demand for China Clay continues considerably below normal, but the market is in firm hands. Some little business of a routine nature is being done, but demand is not consistent, coming by fits and starts as one dealer phrased it. Domestic is somewhat firmer in spots, being held at a range of $15 to $25 per ton, while imported is held at $10 to $25, slightly lower on the inside price.

LAMP AND CARBON BLACK

There is a somewhat easier tone to the market, and carbon gas in cases is quoted lowed at 14 to 25 cents per pound. Lampblack is also 1 cent lower at 14 to 45 cents per pound. Drop is still held at 5½ to 15 cents per pound, while other varieties are unchanged. There has been a quiet steady market during the past fortnight and demand for this commodity is much more active than for other items in the general chemical list.

ZINC OXIDE

An improving demand for zinc oxide is reported, and the market is in a firm position. While some of the demand comes from the paint trade, the bulk of it is reported as coming from the rubber industry. No announcement of new prices has been made thus far by leading producers, but prices for the second quarter are expected to be named some time later in the month. There is a stronger export demand prevalent, France, Italy and England being the chief purchasers thus far.

LITHARGE

A firm, quiet market on litharge has been reported during the past two weeks and prices continue unchanged. There has been no general resumption of buying in large quantities reported and buyers are still operating only in a hand to mouth nature.

LITHOPONE

Producers have stimulated business considerably, but cutting their prices, and the market is now held at 7 and 7¼ cents per pound, while 6⅞ cents can be done

when bought in bags. Demand is picking up steadily and producers are looking for an active market throughout the season. Stocks are not very large and consumers are buying freely, evidently believing that producers have done the best they can in cutting their prices and that the market has now reached its lowest level for the season.

OILS

Trading in the general market for oils has been quiet, and the price trend is generally downward. Crude corn oil is a shade firmer, however, being held at 13½ to 13¼ cents per pound, while linseed oil is lower at $1.45 and $1.46 per gallon. Refined rapeseed oil is also quoted lower at $1.50, a drop of from 5 to 10 cents.

SHELLAC

Shellac prices have been materially lowered since the last report, freer supplies causing the drop. There are ten ships reported en route to the market bringing a total of 40,000 pounds of shellac. Holders lowered their prices in an effort to clean up present stocks, but thus far trade has been quiet. Fine orange is 8 cents lower at 55 and 56, T. N. is 4 cents down at 48 and 49, while bleached bone dry is down 3 cents at 59 and 60.

Prices Current for Chemicals, Fillers, Colors, etc.

Acetone	lb.	.15½ @	.16
Accelerator, in drums	lb.	.85 @	1.00
Acids, Acetic, 56%	cwt.	7.00 @	7.50
Carbolic, C. P.	lb.	*.20 @	.30
*Cresylic, 95%	gal.	1.10 @	1.15
Muriatic, 20 deg.	lb.	1.60 @	2.00
Muriatic, 22 deg.	cwt.	1.37½ @	2.25
Nitric, 42 deg.	cwt.	8.25 @	8.50
Nitric, 40 deg.	cwt	7.75 @	8.25
Sulphuric, 60 deg.	ton	16.00 @	23.00
Tartaric, crystals	lb.	.85 @	.86
Aluminum Flake	ton	29.00 @	31.00
Aniline oil, bulk basis	lb.	.25 @	.26
Antimony, metal spot	lb.	7.25 @	7.50
Oxide	lb.	.14 @	.15
Sulphuret, red	lb.	.25 @	.26
Sulphuret, golden	lb.	.26 @	.30
Sulphuret, crimson	lb.	.42 @	.52
Asbestos	ton.	35.00 @	45.00
Asphaltum, Egyptian	lb.	.18 @	.20
Domestic	ton	22.00 @	30.00
Barium sulphate, technical	lb.	.04½ @	.05
Sulphide	lb.	.07¼ @	.07½
Barytes, prime white imported	ton	*40.00 @	45.00
white, domestic	ton	32.00 @	34.00
off color, domestic	ton	22.00 @	24.00
Benzol, pure, bulk	gal.	.22 @	.27
Beta-naphtol, sublimed	lb.	.85 @	.90
unsublimed	lb.	.65 @	.75
Blacks, Drop	lb.	.05½ @	.15
Ivory	lb.	.16 @	.30
Carbon, gas, cases	lb.	.14 @	.25
Lampblack, R. M.	lb.	.14 @	.45
Mineral blacks	ton	35.00 @	45.00
Blues, Prussian	lb.	.80 @	.90
Soluble	lb.	.90 @	.95
Ultramarine	lb.	.12 @	.50
Browns, Umber, Turkey, burnt, powdered	lb.	.05 @	.06
American, burnt	lb.	.03 @	.04
Cadmium sulphide, yellow	lb.	2.00 @	2.25
Carbon, bisulphide, bulk	lb.	.07½ @	.08
tetrachloride, drums	lb.	.14½ @	.15½
Caustic Soda, 76@78%	lb.	2.90 @	3.25
Chalk, precipitated, extra light	lb.	.05¼ @	.05½
light	lb.	.05 @	.05¼
heavy	lb.	.04 @	.04¼
China clay, domestic	ton	15.00 @	25.00
imported	lb.	*10.00 @	25.00
Fossil flour	lb.	.03¾ @	.05
Gilsonite	ton	50.00 @	55.00
Glue, extra white	lb.	.36 @	.45
medium	lb.	.31 @	.35
low grade		.20 @	.25
Glycerine, C. P. (drums)	lb.	.17½ @	—
Graphite, flake (bbl.)	lb.	.18 @	.20
powdered (bbl.)	lb.	.13 @	.15
Green, chrome, R. M.	lb.	.14 @	.20
Ground glass (fine)	lb.	.03½ @	.04
Hexamethylene	lb.	1.30 @	—
Infusorial earth, powd'd.	ton	60.00 @	123.00
bolted	ton	70.00 @	—
Iron oxide, red, reduced grades	lb.	.07 @	.08
red, pure, bright	lb.	.15 @	.20
Lead, red, dry (casks)	lb.	.10¼ @	.10¾
sublimed	lb.	.09¼ @	.09¾
white, basic carb.	lb.	.09 @	.09½
white, basic sulp.	lb.	.08¼ @	.08½
Lime flour	lb.	.01¾ @	.02
Litharge (casks)	lb.	.09¾ @	.10½
English	lb.	*.12 @	.13
Lithopone, domestic, bbls.	lb.	.07 @	.07¼
Magnesia, carbonate	lb.	.12½ @	.15
calcined, heavy	lb.	.12 @	.14
calcined light	lb.	.65 @	.75
Magnesite, calcined, pwd.	ton	50.00 @	65.00
Mica, powdered	lb.	.04¾ @	.05
Mineral rubber (asphaltum base)	ton	80.00 @	115.00
Naphtha, motor gasoline, (steel bbls.)	gal.	.23½ @	—
68 @ 70 degrees (steel bbls.)	gal.	.30½ @	—
70 @ 72 degrees (steel bbls.)	gal.	.31½ @	—
73 @ 76 degrees (steel bbls.)	gal.	.33½ @	—
machine (wood bbls.)	gal.	.36½ @	—
Oil corn, crude	lb.	.13 @	.13½
corn, refined	gal.	1.45 @	—
linseed (bbls.)	gal.	1.45 @	1.46
Oil palm, Lagos	lb.	*.18 @	.20
pine yellow	gal.	.67 @	.69
rapeseed, refined	gal.	1.50 @	—
rapeseed, blown	gal.	1.65 @	—
rosin, first rectified	gal.	.74 @	—
tar (commercial)	gal.	.43 @	—
Orange mineral, American	lb.	.13¼ @	.14¼
imported	lb.	*.15 @	.20
Paraphenylenediamine	lb.	3.50 @	4.00
Petrolatum, bbls., amber	lb.	.06 @	.07
pale yellow	lb.	.06 @	.07
Pine tar kiln	bbl.	13.00 @	—
Pitch	bbl.	8.00 @	—
Plaster of paris	bbl.	2.00 @	3.00
Red Tuscan	lb.	.23 @	.30
Indian (reduced)	lb.	.08 @	.10
Standard	lb.	.12 @	.16
Rosin (common to good) @ 280 lbs.	bbl.	12.70 @	—
Rotten stone, powdered	lb.	.02½ @	.04½
Rubber, substitute, black	lb.	.13 @	.17
white	lb.	.15 @	.24
brown	lb.	.20 @	.25
Shellac, fine orange	lb.	.55 @	.56
T. N.	lb.	.48 @	.49
Bleached ordinary	lb.	.50 @	.51
Bleached bonedry	lb.	.59 @	.60
Silex (silica)	ton	22.00 @	40.00
Soapstone, powdered	ton	15.00 @	25.00
Starch, corn, powdered	lb.	4.12 @	4.34
Sulphur, crude	ton	*50.00 @	—
100 pounds		3.20 @	4.25
roll		3.20 @	—
commercial superfine		2.50 @	—
Talc, American	ton	20.00 @	40.00
French	ton	*30.00 @	35.00
Toluol, pure, in drums	gal.	.25 @	.30
Tripolite earth	ton	60.00 @	70.00
Turpentine, pure gum—spirits	gal.	.69 @	.69½
wood	gal.	.62 @	.64
Venice, artificial	gal.	.13 @	.14
Vermilion, English	lb.	1.60 @	—
Wax, beeswax, crude yel.	lb.	.45 @	.46
ceresin, white	lb.	.22 @	.26
carnauba, No. 3	lb.	.53 @	.54
Montan	lb.	*.35 @	.36
ozokerite, black	lb.	*.60 @	.61
ozokerite, green	lb.	*.65 @	.80
Wax, Paraffin, refined, 118 120 M. P. (bbls.)	lb.	.09¾ @	.10
Paraffin, 123/125 M. P.		.11¼ @	—
Wax, Paraffin, 128/130 M. P.	lb.	.12½ @	.16
133/135 M.P.	lb.	.13¼ @	.13½
Crude, 120/122 M.P.	lb.	.10¾ @	—
124/126 M.P.	lb.	.08½ @	.08¾
Whiting, commercial	cwt.	1.25 @	—
Alba	cwt.	1.25 @	—
Paris, white, American	cwt.	1.50 @	1.75
English cliffstone	cwt.	.75 @	2.27
Yellow chrome	lb.	.27 @	—
Zinc oxide, States Brand	lb.	.10 @	—
horsehead brand	lb.	†.10 @	.10¼
selected	lb.	†.10½ @	.10¾
"XX red"	lb.	†.10 @	.10¼
French process, green seal	lb.	†.12½ @	.12¾
red seal	lb.	†.12 @	.12½
white seal	lb.	†.13 @	.13¼
substitutes	ton	35.00 @	40.00
sulphate, pure	lb.	*.04½ @	.05

* Nominal. † Contract prices.

Crude Rubber

NEW YORK, March 7, 1919.

Frequent arrivals of large lots of crude rubber from primary points have caused an easier tone to prevail in the local market since our last report, and several price reductions have been effected. Recent arrivals have been so large that within two days there were 8,962 cases brought into New York from London.

Manufacturers are not displaying much interest in the market at present, and trading is consequently dull, only filling-in orders being received from time to time. Deliveries to the manufacturers on contract are said to be sufficient to carry them over under present circumstances. Para up-river fine is offered at 57½ cents, a decline of 1 cent during the fortnight, and Islands fine is ½ cent lower at 48½ cents.

Pronounced weakness has been shown in the Ceylon grades, smokes sheets ribbed now selling at 54 @ 54½ cents, against 55 @ 56 cents at the time of our last report. Smoked sheets plain rate lower at 53½ cents, first latex pale crepe 1 to ½ cent down at 55 @ 55½ cents, and amber crepe is 1 cent lower at 54 cents. Guayule is 2 cents lower at 32 cents and Balata block Panama is selling at 53 cents.

Para—Up-river fine	57½	@	....
Up-river medium	53	@	....
Up-river coarse	34	@	....
Caucho ball	34	@	....
Islands fine	48½	@	....
Islands coarse	22½	@	....
Cameta	23	@	....
Madeira fine	62	@	....
Ceylons—Smoked sheets, ribbed	54	@	54½
Smoked sheets, plain	53½	@	....
First latex pale crepe	55	@	55½
Amber crepe	54	@	....
Clean brown crepe	54	@	....
Centrals—Corinto prime	37	@	....
Esemeralda, prime	37	@	....
Mexican scrap	34	@	....
Balata sheets	90	@	....
Balata, block Panama	53	@	....
Guayule	32	@	....
Africans—Rio Nunez string—Massai, red	55	@	....

Scrap Rubber

NEW YORK, March 7, 1919.

The scrap rubber market continues stagnant, with consumers still holding off in spite of another downward revision of prices, principally in tires. This revision was made with the object of securing reclaimers' business, but the latter are not likely to be greatly interested in scrap until rubber manufacturers make larger demands for reclaimed stock.

There has been some trading in boots and shoes among small dealers, but the larger ones, like the reclaimers, are practically out of the market.

Inner tubes are dull and easy in tone; while mechanicals are also inactive.

The following are averages of dealers' sales prices in New York:

Boots and shoes	7.25	@	7.50
Arctics, trimmed	5.50	@	5.75
Arctics, untrimmed	4.50	@	4.75
Tires—Automobile	3.25	@	3.50
Bicycles, pneumatic	3.00	@	3.25
Mixed hose	1.25	@	1.50
Air brake	4.00	@	4.20
Inner tubes, No. 1	18.50	@	19.00
Inner tubes, No. 2	18.50	@	19.00

Kelly Opens New Branches

The Kelly-Springfield Tire Company, New York City, has taken over the business of the Boss Rubber Company in Denver, Col., Butte, Mont., and Salt Lake City, Utah. A branch has been opened at 1550 Broadway, Denver, under the management of H. A. Gabriel; H. B. Gerrard and C. D. Cole have been made managers of depots at Salt Lake City and Butte, respectively.

The Boss Rubber Company referred to here is distinct from the Boss Rubber Company, El Paso, Tex., which is one of the Kelly-Springfield's livest distributors.

Quinn Leaves Ajax

Edward Quinn, well known in automobile tire circles, has resigned from the Ajax Rubber Company, New York City, and has become associated with H. P. Baran in the Turck Tire Service Company, Brooklyn, N. Y. Mr. Quinn had been with the Ajax for about twelve years and during the last few years he has managed the New York City branch of that company.

American Rubber Patents

ISSUED DECEMBER 31, 1918

1,289,070—To Fridtjan Anderson, Christiana, Norway. Elastic non-pneumatic tire.

1,289,106—To Hugh Bullock, Andover, Mass., assignor to Converse Rubber Shoe Co., Malden, Mass. Sole.

1,289,194—To Barney F. Knoblock, Pittburgh, Pa. Attaching device for non-skid chains.

1,289,223—To Thomas Midgley, Sr., and Thomas Midgley, Jr., Columbus, Ohio. Method of producing collapsible cores.

1,289,233—To De Courcy Neal and Adrian O. Abbott, Jr., Detroit, Mich., assignors to Morgan & Wright, Michigan.

1,289,307—To George E. Thompson, Stockton, Cal. Pressure indicator for pneumatic tires.

1,289,324—To Henry C. Wagner, Woonsocket, R. I., assignor to Woonsocket Rubber Co., R. I. Device for manipulating rubber stock.

1,289,420—To William F. Ewald, Jana, S. D. Resilient wheel.

1,289,461—To Clarence E. Holliday, Duncan, Nebr. Wheel center.

1,289,478—To John Kosak, Milwaukee, Wis. Automobile tire.

1,289,485—To George H. Lewis, Chicopee Falls, Mass., assignor to the Fisk Rubber Co., Chicopee Falls, Mass. Automatic cutting and beveling apparatus.

1,289,500—To Stewart R. McKay, Cleveland Heights, Ohio, assignor to the McKay Co., Cleveland, Ohio. Demountable rim.

1,289,575—To Marcel H. Tisne, New York, N. Y., assignor to A. Schroder's Son, Inc., Brooklyn, N. Y. Valve.

1,289,586—To Milton T. Weston, New York, N. Y. Resilient wheel.

1,289,603—To Albert W. Bailey, Jasper, Mich. Pneumatic tire tool.

1,289,630—To Everett R. Bresler, Amanda, Ohio. Demountable tire; carrying rim.

1,289,662—To Myron H. Clark, Hastings-on-Hudson, N. Y., assignor to Goodyear's Metallic Rubber Shoe Company, Conn. Footwear.

1,289,706—To William J. Eggers, Brooklyn, N. Y., Mary J. Eggers, administratrix of said William J. Eggers, deceased. Nipple.

1,289,712—To Robert M. Evans, Seattle, Wash. Air-pressure indicator for pneumatic tires.

1,289,714—To Charles Elkin, New York, N. Y. Hose-coupling.

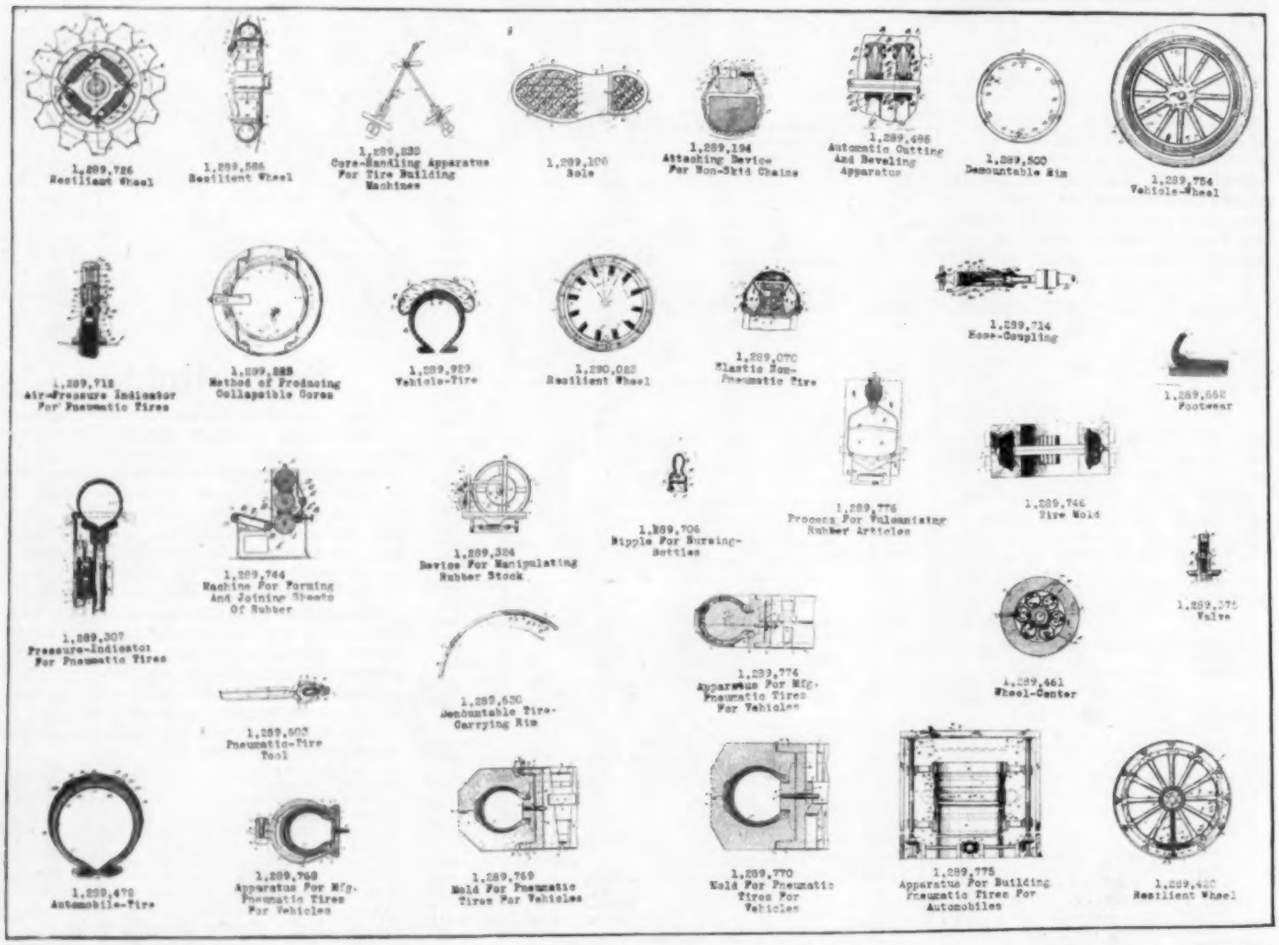
1,289,726—To James T. Garver, New York, N. Y. Resilient wheel.

1,289,744—To John Hinna, Chicopee Falls, Mass., assignor to Fiske Rubber Co., Chicopee Falls, Mass. Machine for forming and joining sheets of rubber and the like.

1,289,746—To Albert Hargraves, Akron, Ohio, assignor to the Firestone Tire & Rubber Co., Akron, Ohio. Tire mold.

1,289,754—To Edward Hayes, Brooklyn, N. Y., assignor of two-thirds to Hayes-Diefenderfer Co., Inc., New York, and one-third to George B. Pickop, New Haven, Conn. Vehicle wheel.

1,289,768—To Ernest Hopkinson, New York, N. Y. Apparatus for manufacturing pneumatic tires for vehicles.


1,289,726 Resilient Wheel
1,289,584 Resilient Wheel
1,289,630 Core-Handling Apparatus For Tire Building Machines
1,289,106 Sole
1,289,194 Attaching Device For Non-Skid Chains
1,289,486 Automatic Cutting And Beveling Apparatus
1,289,500 Demountable Rim
1,289,754 Vehicle-Wheel
1,289,712 Air-Pressure Indicator For Pneumatic Tires
1,289,685 Method of Producing Collapsible Cores
1,289,929 Vehicle-Tire
1,290,082 Resilient Wheel
1,289,070 Elastic Non-Pneumatic Tire
1,289,714 Hose-Coupling
1,289,662 Footwear
1,289,776 Process For Vulcanizing Rubber Articles
1,289,746 Tire Mold
1,289,744 Machine For Forming And Joining Sheets Of Rubber
1,289,324 Device For Manipulating Rubber Stock
1,289,706 Nipple For Nursing-Bottles
1,289,575 Valve
1,289,307 Pressure-Indicator For Pneumatic Tires
1,289,774 Apparatus For Mfg. Pneumatic Tires For Vehicles
1,289,461 Wheel-Center
1,289,630 Demountable Tire-Carrying Rim
1,289,603 Pneumatic-Tire Tool
1,289,478 Automobile-Tire
1,289,768 Apparatus For Mfg. Pneumatic Tires For Vehicles
1,289,769 Mold For Pneumatic Tires For Vehicles
1,289,770 Mold For Pneumatic Tires For Vehicles
1,289,775 Apparatus For Building Pneumatic Tires For Automobiles
1,289,420 Resilient Wheel

1,289,769—To Ernest Hopkinson, New York, N. Y. Mold for pneumatic tires for vehicles.

1,289,770—To Ernest Hopkinson, New York, N. Y. Mold for pneumatic tires for vehicles.

1,289,773—To Ernest Hopkinson, New York, N. Y. Apparatus for use in vulcanizing pneumatic-tire casings for vehicles.

1,289,774—To Ernest Hopkinson, New York. N. Y. Apparatus for manufacturing pneumatic tires for vehicles.

1,289,775—To Ernest Hopkinson, New York. N. Y. Apparatus for building pneumatic tires for automobiles.

1,289,777—To Jeremiah S. Mahoney, New Haven, Conn., assignor to the Goodyear's India Rubber Glove Manufacturing Co., Conn. Method of products jointures for vulcanized rubber parts.

1,289,929—To Edward G. Schleicher, Stamford, Conn. Vehicle tire.

1,289,936—To William Seidel, Chicago, Ill. Wheel.

1,289,958—To Benedetto Tamburello, New York, N. Y. Wheel rim for pneumatic tires.

1,290,023—To George Edgar Clarke, Toronto, Ontario, Canada. Resilient vehicle wheel.

ISSUED JANUARY 7, 1919

1,290,033—To William M. Allan, San Antonio, Tex. Vehicle wheel.

1,290,041—To Sars J. Anderson, Grantsburg, Wis. Hose repair device.

1,290,113—To Victor Dusenhofer, Chicago, Ill. Spring tire.

1,290,128—To Clarence O. Duffy, Dallas, Tex. Quick tire patch for pneumatic tires.

1,290,211—To James Lawrence Jensen, Cowley, Wyo. Demountable rim for automobile wheels.

1,290,243—To Israel Kornetsky, Chelsea, and Daniel P. Sullivan, Boston, Mass. Valve for pneumatic tires.

1,290,365—To Ferdinand Scheiblecker, New York, N. Y., assignor to Salz Bros., New York, N. Y. Fountain pen of the self-filler type.

1,290,441—To Elijah F. Wells, Rummerfield, Pa. Automobile tire chain.

1,290,453—To Joseph S. Williams, Philadelphia, Pa. Resilient wheel equipment.

1,290,474—To Jozef Achberger, Middletown, Ohio. Non-skid device.

1,290,505—To George W. Bulley, St. Joseph, Mich. Rubber working machine.

1,290,519—To John T. Cowan, Pitt, Pa. Resilient wheel.

1,290,556—To Carrol St. Hilaire, Gardner, Mass. Demountable rim.

1,290,576—To Delaska A. Kendall, San Diego, Cal. Process of preparing tire treads.

1,290,582—To Henry P. Kraft, Ridgewood, N. J. Tire valve.

1,290,625—To John Frederick Massey and William W. Rabensdorf, Fairchild, Wis. Spring wheel.

1,290,630—To Charles V. Merling, Centralia, Wash. Resilient vehicle tire.

1,290,692—To Joseph A. Ames, Nashville, Tenn. Waterproof footwear.

1,290,693—To George M. Anderson, Washington, D. C. Rubber heel.

1,290,781—To Alonzo D. Ramsey, Sedalia, Tenn. Tire armor.

1,290,788—To Michael Schedlbauer, Warren, Mich. Vehicle wheel.

Pearce Tire in Full Operation

The Pearce Tire and Rubber Company, Ashtabula, Ohio, is now in full operation in its new plant. Officials of the company state that within sixty days their production will exceed 100 tires a day, and that this output will be increased gradually until the full capacity of the factory, 500 tires a day, is reached.

From Sumatra to East Africa Via the U. S.

WHILE the German troops were being pushed out of East Africa, supplies for the British Forces were continuously sent up-country in motor lorries equipped with United States Tires. Those tires had been manufactured here in America in the factories of the United States Rubber Company. The crude rubber had come from the plantations of the Company in Sumatra.

This is but one instance of the far-reaching commercial activities of the United States Rubber Company. In fact, it is difficult to realize the tremendous part played by its rubber products in the daily life of the people of the world.

This predominance in the production of every sort of rubber goods was not reached in a day. It is due to 76 years of cumulative, organized experience.

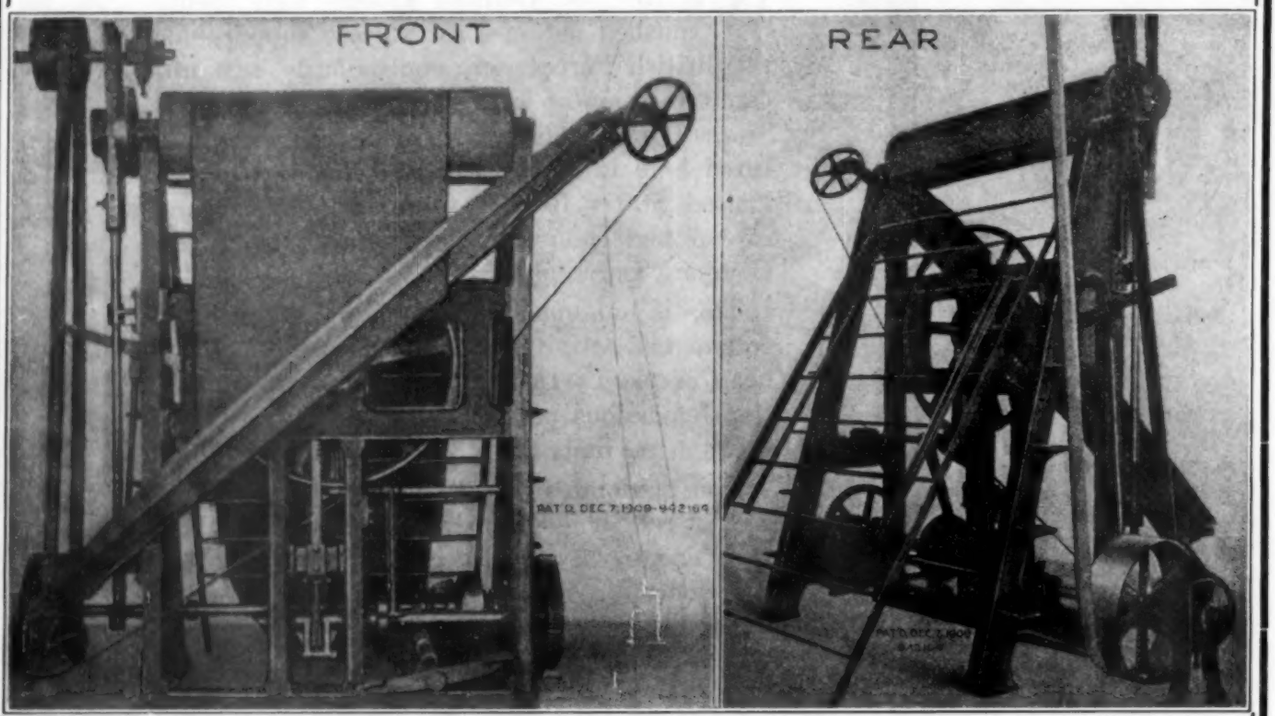
Through the variety and quantity-balance of our huge output, we are enabled to combine quality and economy in the maximum.

We invite your attention especially to our rubber footwear, canvas rubber-soled shoes, weatherproof clothing, tires for automobiles, motor trucks and all other vehicles, druggists' rubber goods, flooring, insulated wire, soles and heels, belting, hose, packing, mechanical and moulded goods of every description.

United States Rubber Company

An Improved Machine for Cutting Cloth on the Bias

Patented by Andrew C. Bolton
December 7th, 1909 **No. 942164**



Front View **Back View**

This machine has many advantages over any other now in the market for cutting frictioned cloth on the bias, a few of which are, accuracy in cutting, simplicity and lightness of construction, quickness in adjustment, occupying but a very small floor space, and can be operated at a practically nominal cost, and may be technically described as an upright bias cutter.

It will cut fabric of any width and on any angle.

A practical and unique feature about this cutting device is, that the knife can instantly be changed to cut on any angle from a horizontal or at a right angle to the length of the material to an angle of sixty (60) degrees, without the adjustment of any other part of the machine.

Patented all over the world. If interested please send for descriptive pamphlet and further information to the

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Only the highest grade materials obtainable, and always the utmost care, go into the making of HODGMAN Rubber Sundries for hospital, home, office and sport use. Also into the making of HODGMAN Long Grain, Rubber Auto Top Material, Coated Cloth, Rubber Clothing, Mackintoshes, and all rubber goods that carry the HODGMAN trade mark.

HODGMAN Rubber Goods have stood the test of many years, and hold an honored place among high grade products.

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Crude Rubber Handling Costs Cut $80,000 a Year

Such is the record made at the plant of one large rubber manufacturer by the

W-S-M CRUDE RUBBER CUTTING MACHINE

Every Manufacturer who buys crude rubber has encountered the difficulties due to the British Government's ruling that all crude rubber shipped must be compressed into bales. It is estimated that this compressing has cost the rubber manufacturers two cents a pound additional in handling.

The Wellman-Seaver-Morgan Company is offering a machine which not only overcomes the difficulties due to the compressing but also does the work much more quickly and cheaply than the method employed before the British Government's ruling was made.

We shall be glad to send you full particulars concerning this machine.

The Wellman-Seaver-Morgan Company

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